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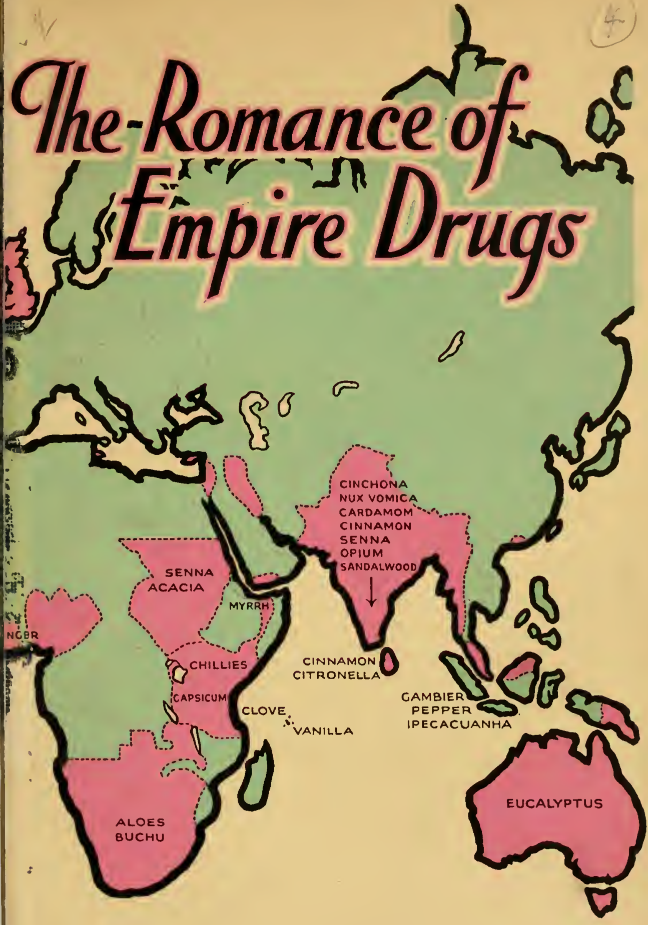
The Romance of Empire Drugs



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The Romance of Empire Drugs

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English Herbs, African Fruits,
Australian Gums, Indian Roots,
Canadian Beaver and New Zealand Whale,
All contribute to this Empire tale.

STAFFORD ALLEN & SONS, LTD.
MANUFACTURING CHEMISTS
ESSENTIAL OIL DISTILLERS
COWPER STREET, LONDON, E.C.2
ESTABLISHED 1833

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P.75D. 9.32

Excellent herbs had our fathers of old—
Excellent herbs to ease their pain—
Alexanders and Marigold,
Eyebright, Orris, and Elecampane—
Basil, Rocket, Valerian, Rue,
(Almost singing themselves they run)
Vervain, Dittany, Call-me-to-you—
Cowslip, Melilot, Rose of the Sun.

“*Our Fathers of Old*”—Rudyard Kipling

The Romance of Empire Drugs

Empire Economics

In these days, when closer economic co-operation between the various units which go to make up the British Commonwealth of Nations is being advocated and the Imperial Parliaments are engaged in formulating plans for making the Empire more and more self-supporting, it is of interest to consider the position as regards the supply of those products which enter into the important field of medicine.

War Against Disease

The British Empire is committed to the abolition of war between nations, but there is one war which it must ceaselessly wage—the war against disease, and with its far-flung territories, widely divergent climates and peoples, it has to contend in one part or another with practically every ill to which the flesh is heir. In view of the extensive opportunities afforded them, it is not surprising, therefore, that in the past British medical workers have made an unsurpassed contribution to the conquest of disease. Such a medical service, however, calls for a correspondingly comprehensive materia medica ; and the supply of medicaments available within the Empire is consequently of special interest and moment.

That the Empire does produce a large number of medicinal substances, amongst them some of the most

Empire Drugs

important, may be stated as a fact, and what is more to the purpose of this booklet, their origin and supply make a most interesting and romantic story. The flora, in particular, of the Empire is varied and abundant and the numerous medicinal plants it includes play a no mean part in the commerce of many of the Dominions.

New-Old Remedies

One word with regard to the nature of these medicines. In the fight against ill-health, new methods and fresh weapons are continually being introduced and their discovery is frequently surrounded by glamour, but it should not be overlooked that there is a number of interesting remedies which have either been employed empirically from time immemorial or which, after long use in ancient Occidental and Oriental civilisations, have been brought into current therapy. The fact that modern medicine affirms the value of these age-old drugs as rational therapeutic agents is surely striking evidence of another romantic side to the art of healing.

Aim of the Work

In the following pages reference will be found to the more important vegetable products used in medicine, coming from territories under the British Flag. We hope the brochure will appeal not only to those readers to whom the name of Stafford Allen is well known, but to many others who are, perhaps, not so much interested in the production as in the history of drugs. Of scientific and technical treatises on the chemistry and pharmacology of drugs there is such an abundance that it has not been considered necessary to deal with these aspects in the present work. On the other hand, in bringing together some notes and illustrations upon the history and commerce of the drugs produced within the British Commonwealth of

Nations, the wish is expressed that something of real and novel interest is being presented to the reader.

It will be found that there are many medicinal substances produced within the British Empire not included in the present work, which is mainly concerned with vegetable drugs. It is worth mentioning, therefore, that the Empire is rich in practically all products used in medicine.

From animals such as the sheep, cow and pig, we obtain numerous organo-therapeutic products of which, perhaps, thyroid and pituitary substance, adrenalin, insulin, liver extract and pepsin are the best known. The animal stock of the Empire is unsurpassed for the supply of these preparations, and here it might be noted that British scientists have played a foremost part in placing this branch of medicine on a firm footing. Thyroxin, the active principle of the thyroid gland, was first synthetically prepared, in 1929, by an English chemist—Harington—who received tributes from all parts of the world for his achievement, which was effected in nineteen distinct and highly complicated chemical stages.

The synthetic product is now manufactured on a commercial scale at half the cost of its natural analogue. It is given with marvellous results to Cretins—idiot-dwarfs—whose lives were hopeless until the discovery that their condition was due to deficiency of the hormone of the thyroid—one of the most important bodies in "the wonder world of the ductless glands" as Lord Dawson of Penn recently described them. To Dr. Banting, the Canadian, humanity owes an irreparable debt for the discovery of insulin, the invaluable remedy in diabetes. And there are many others.

Other creatures contributing to medicine are the whale (Spermaceti and Ambergris) and the Canadian Beaver (Castoreum). Fish found in British waters include the cod, which gives cod-liver oil. There are few insects which contribute anything important to medicine, but *Coccus cacti*, Cochineal, formerly figured to a considerable, and now figures to a slight, extent in the commerce of the British West Indies.

Birds, too, are not exempt from participation in the medicinal field, for the egg of the domestic hen (surely an Empire product) is employed as an emulsifier in pharmacy and for the production of lecithin.

All forms of life, therefore, flesh, fish and fowl (not to mention fly) inhabiting the Empire make their contribution to the ancient art of healing. A casual review, moreover, shews that the Empire is excellently served from the mineral standpoint and we may perhaps conclude our survey by mentioning that one of the latest sources of supply which has been brought into service is that of bromides from the Dead Sea salts in Palestine. This is an important instance of the production of a drug within the Empire hitherto only available from territories outside. It is to be hoped that such an instance will be multiplied in the future.

The publishers wish to acknowledge the following works, from which much useful information has been obtained : "*Pharmacographia*" (Flückiger and Hanbury), "*Materia Medica*" (Pereira), "*The Chemist and Druggist,*" *Medicinal Plants* (Bentley and Trimen), "*The British Pharmaceutical Codex*". Acknowledgment has also to be made to the following, who have supplied photographs for the illustrations :—The Imperial Institute. The Royal Botanic Gardens, Kew. The South African Government. The Central Experimental Farm, Ottawa. The New Zealand Government. The High Commissioner for India. The West India Committee. Alyson Minchin, Esq., I.F.S. The Government of Somaliland. The Government of Newfoundland. The High Commissioner for Canada. Forest Service, Department of Interior, Ottawa, Canada. Department of Lands and Fisheries, Irish Free State Government. Professor Starker, O.S.C. (A.J.Ph.). "*Gum Arabic,*" by Capt. H. S. Blunt, Oxford University Press. "*The Chemist and Druggist.*"

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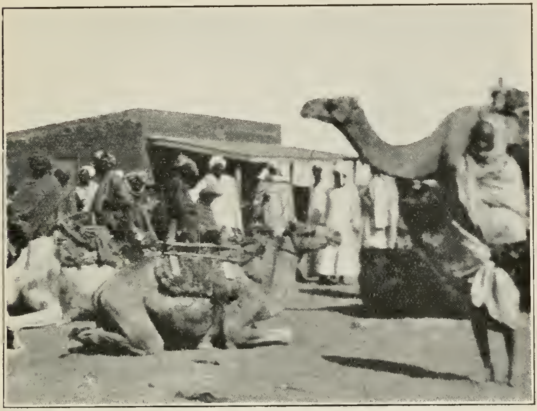
You showed me nutmegs and nutmeg husks,
Ostrich feathers and elephant tusks,
Hundreds of tons of costly tea
Packed in wood by the Cingalee
And a myriad drugs which disagree—
Cinnamon, myrrh, and mace you showed,
Golden paradise birds that glowed,
More cigars than a man can count
And a billion cloves in an odorous mount

. . . .

John Masefield, *after a visit to the*
Cutler Street Warehouses

GUM ACACIA ——— SUDAN



Native Sellers awaiting payment after public auction. El Obeid

THE GENUS ACACIA, Fam. *Leguminosæ*, comprises several species of gum-yielding trees, the history of which goes back to very remote times. The plant was known to the ancient Greeks and Romans, and is probably referred to in the Bible as the " Shittah " tree.

Kordofan Gum (Gum Arabic), *Acacia verek* (*A. Senegal*) by far the most important of the acacia class, is obtained from the Hashab trees of the famous Kordofan Geneiras. There are other allied varieties—Gezireh, Gedaref, Gebelaine, Darfur and Tendelti, all from the Sudan. The trees are " tapped " by removing a strip of bark and the " tears " of gum which exude and gradually dry are "picked" by natives, there being several "pickings" in a season.

The gum is transported by camels to El Obeid, where it is sorted and sold by auction, then to be forwarded to Port Sudan for shipment to Europe. The best gum (Kordo-

Native collecting Gum Arabic

(Reproduced from "Gum Arabic" by courtesy of Capt. H. S. Blunt, Clarendon Press, Oxford)

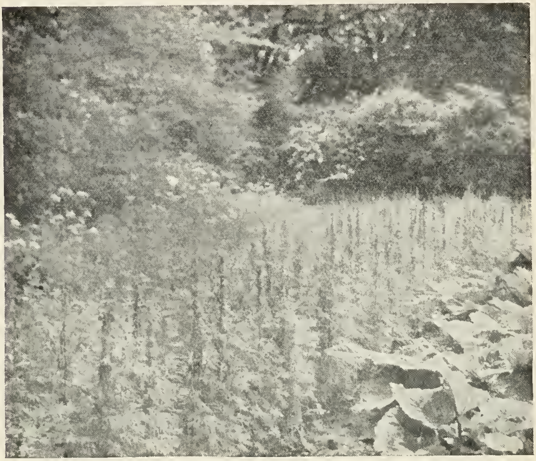
fan) is white in appearance, the broken fragments often being transparent. Other varieties such as Senegal, East Indian and Cape are generally yellowish. They are greatly inferior to Kordofan and of much less commercial value.

Of an extremely complex nature, the gum is said to form as the result of bacterial activity. Possessing a specific " thickening " property in solution, it finds invaluable use in those fields where a substance of binding, suspending or adhesive qualities is required. Acacia has been used in medicine since the time of Hippocrates. It is chiefly employed as an emulsifier, suspending agent and demulcent.

StaffAllenS

have for almost a century enjoyed special advantages for the importation of the finest Kordofan Gum, which they grind in their mills at Cowper Street.

ACONITE ——— ENGLAND



Aconite and Rhubarb growing at Long Melford

THERE are references in ancient Greek writings to a plant which at first sight might be taken for Aconite, but although the latter is a native of Greece and is known to-day in Greek by the name mentioned by Theophrastus, it is doubtful whether *Aconitum Napellus* was actually the plant referred to.

Aconitum Napellus Linn., Fam. *Ranunculaceæ*, is indigenous to Europe. It may be found growing wild in some districts in England, but it has been cultivated here for centuries.

Considerable confusion has existed as to the identification and designation of the many varieties of Aconite, Linnæus's description being considered in the first place as somewhat vague and confusing. The fine, English-grown plant is distinguished by the flowers having the characteristic shallow hood of the typical *Aconitum Napellus* (*Anglicum*). This flowers earlier than the other forms and its flowers have a paler and more purplish hue, whilst its leaves are also differentiated by their cut. The plant, known as Monkshood on account of the shape of the flower and Wolfsbane from its poisonous nature, is a perennial, growing to a height of three or four feet.

The conical root is the organ which provides the means of propagation of the plant by developing daughter roots, containing a starchy reserve matter. All parts of the plant contain the active principle—the alkaloid Aconitine—and both the leaves and the root have been used in medicine, but the latter is now almost exclusively employed.

Aconitine, which is highly toxic, produces the well-known tingling sensation on the tongue when a sliced root is licked.

Aconite of commerce is occasionally adulterated, species of European, Indian and Japanese origin, such as *A. Cammarum* and *A. Fischeri*, of varying therapeutic activity appearing in the market from time to time. In addition to microscopical and chemical tests, bio-assay methods with animals have been employed, with a view to standardizing the therapeutic activity of Aconite preparations.

Aconite has distinct pharmacological properties and is prescribed in various disorders, particularly neuralgia.

StaffAllenS

grow Aconite at Long Melford and manufacture its preparations in their factory there.

ALOES ——— SOUTH AFRICA

Aloe ferox. Cape Province
From the High Commissioner's Office, S.A. House

ACCORDING to a legend mentioned by an Arabian writer, Edrisi, Aloes was known to the ancient Greeks and

Romans as a product of Socotra as far back as the 4th century B.C. After Alexander the Great had conquered the Persians and Indians, Aristotle made the request that he should discover on his return by sea the island yielding the drug and, so, runs the fable, came Alexander to capture and populate Socotra with Greeks, whose strain remained there for centuries, becoming Christians with the advent of the Messiah. The people flourished on the island, enjoying its climate, developing its fertility and exploiting the sovereign worth of its Aloe as a medicine. As regards historical facts, Dioscorides, Pliny and later Greek and Arabian writers mention Aloe, whilst it would appear to have become familiar in Britain about the 10th century, there being evidence that the drug was recommended to Alfred the Great by the Patriarch of Jerusalem.

Aloe ferox, Miller, Fam. *Liliaceæ*, Cape Aloes, official in the British (1932), German, Danish and other Continental pharmacopœias, is a native of the South-Western districts of the Cape Province. It is obtained by evaporating the juice of the cut leaves. Cape Aloes finds its largest market in Germany, but it is used extensively in this country for veterinary purposes. It is invariably bright and glossy, and possesses a distinctive odour.

Cape Aloes is not the only kind produced within the British Empire ; both Socotrine and Zanzibar come from British Territory, whilst Curaçao formerly came from a British Possession, as indicated by its common name, Barbados. Aloes and its active constituent Aloin, enter into the composition of purgatives.

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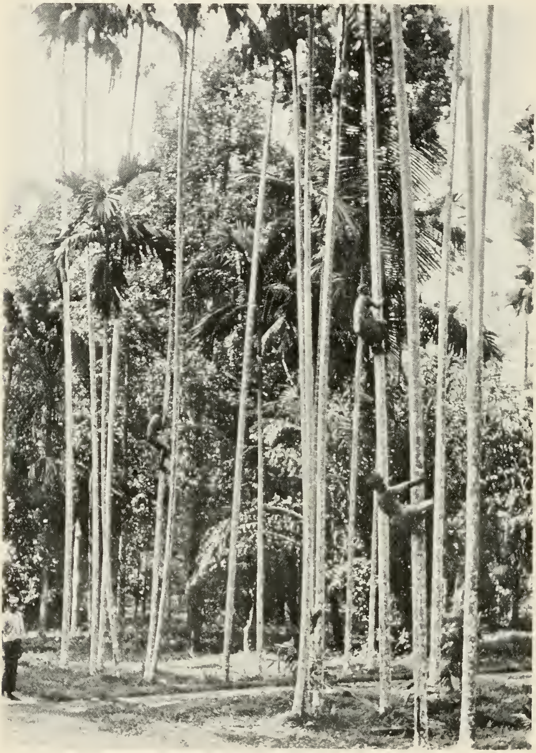
Aloes figures in Day Books at Cowper Street as far back as 1836. At that time StaffAllenS were pioneers in the movement for purity in powdered drugs.

ARECA ——— INDIA



Areca Nut Palms

It is of interest to note that a crooked Areca Nut palm is as rare as a straight coconut palm

(From the Imperial Institute Collection)

ARECA CATECHU Linn. (Fam. *Palmæ*), the source of Areca Nuts, is a tall, handsome palm, distributed widely throughout India and the Eastern Archipelago. Areca is referred to in ancient Sanskrit works, whilst the Chinese call it Pin-lang, a name of Malay associations, whence presumably the Chinese obtained supplies from very remote times.

It would appear that Areca figures in a Chinese work dating back to about 100 B.C., on the drugs of the Emperor Wu-ti. In the East it has always had wide use as a masticatory, but it has also been given there as a vermifuge both to animals and human beings. In Europe its use is mainly confined to veterinary practice, being administered to expel tapeworm, but it was included in the B.P. of 1867. Areca is sometimes employed as a component of tooth powders.

The nuts, which are the seeds, are also known as Penang nuts, and are readily distinguished, being of nutmeg size, hard, conically shaped, flat based and odourless. Internally they show a mottled appearance and are somewhat bitter to the taste.

The chief collecting centre is Bombay, supplies coming from Madras, Singapore, Penang and Ceylon. As much as 10 to 20 thousand tons are exported from either Malaya or Ceylon in one year.

StaffAllenS

handle considerable amounts of Areca Nut and are able to meet all requirements for this drug.

ARROWROOT ——— B.W.I.

Gathering Arrowroot, St. Vincent, B.W.I.
(*From the West India Committee*)

M*ARANTA arundinacea* Linn., Fam. *Marantaceæ,* a herb growing to a height of about 5 feet, is a native of tropical Central America and the West Indies. A slightly different variety—*Maranta Indica,* Tussac, occurs in the East Indies. The plant would appear to have been first mentioned by Sloane in his catalogue of the flora of Jamaica (1609).

According to tradition the root was employed by the Indian natives as an antidote to poisoned wounds and this probably explains the origin and meaning of the name, although this has also been stated to be a corrupted form of an Indian word signifying " mealy root ".

Arrowroot was introduced to England from Jamaica at the turn of the 18th century, and on account of the fine white quality starch it yielded—surpassed only by the best wheat—it was soon recognised as a valuable dietetic aid.

As an easily-digested, energy-producing food, the analysis of Arrowroot in the light of modern dietetics shews that it leaves little to be desired. It possesses marked gelatinising properties. Further, it would appear to contain a vitamin not present in such cereal starches as those of wheat, rice and maize. These properties indicate a wider use for Arrowroot as a foodstuff than merely as an item of invalid diet, to which its employment in the past has principally been confined. The Empire Marketing Board has encouraged the use of the product in their booklet (Empire Recipes, Series III), in which it figures in a number of household dishes.

Arrowroot has been cultivated in a number of tropical countries—in India, Natal and, of course, B.W.I. Bermuda once claimed to be the source of the best variety but nowadays the island of St. Vincent practically controls production, and supplies the requirements of the U.S.A., Canada and Great Britain, which are by far the largest consumers.

The preparation of the commercial product is comparatively simple. After removal of the top joints for further cultivation, the tubers are scraped to take off the external fibrous covering and then reduced to pulp by somewhat primitive methods. The pulp is then washed in trays by means of running water. This removes the starch particles, which are again washed, allowed to sediment, and finally dried.

StaffAllenS

quote favourably for the finest
St. Vincent Arrowroot.

BELLADONNA ——— ENGLAND

Cutting and carting Belladonna at Long Melford

ALTHOUGH *Atropa Belladonna*, Linn., Fam. *Solanaceæ*, with its extensive habitat, was doubtless known to the ancient Greeks and Romans, it is not certain that it was actually used by them. Both Dioscorides and Pliny are held to have referred to it under other names, whilst Galen is said to have employed it medicinally. It appears in the *Grand Herbier* printed in Paris about 1504 and Tragus (1532) mentions it as *Solanum hortense nigrum*. According to certain historians it was the herb which caused calamity amongst the Romans in their retreat from the Parthians, whilst the Scots are said to have employed it with effect against the Danes.

The origin of the name Bella-Donna, popularly ascribed severally to its use by Italian ladies as a cosmetic ; its employment by Spanish beauties to dilate the pupils of their dark eyes, and to its adoption by an Italian murderer, Leucota, to poison beautiful women, is difficult to establish from authentic evidence.

Atropa Belladonna grows wild in most European countries. It is cultivated in England and attempts have been made to acclimatize it in America. Its successful cultivation presents some difficulty and considerable experience is required to obtain a therapeutically effective product. The reputation of Belladonna was built on the green extract. Its preparation represented pharmaceutics in its widest sense, involving as it did cultivation, collection, rapid transit from field to factory, expression of the juice, separation of chlorophyll, evaporation to extract and re-addition of chlorophyll.

The advent of the B.P. 1898 marked a fresh stage in the pharmaceutics of Belladonna.

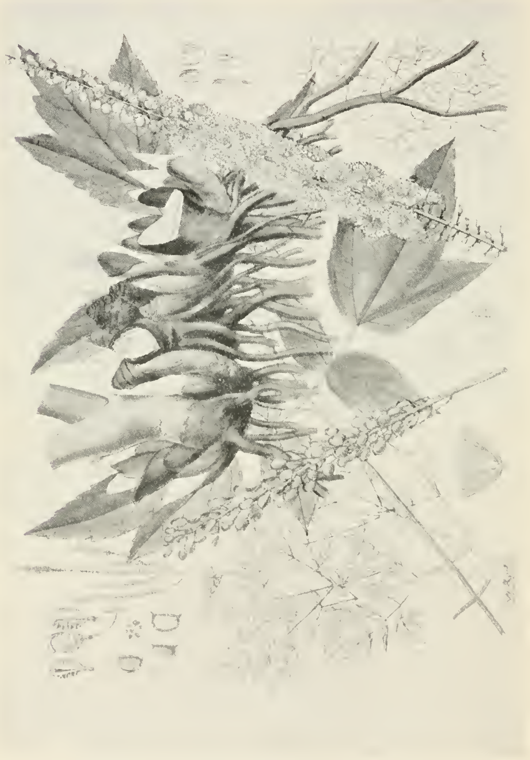
Since then the criterion of value of its preparations has been the alkaloidal strength as determined by chemical methods of assay.

Belladonna and its alkaloids, atropine and hyoscyamine, have extensive uses in external and internal medicine, acting as powerful antispasmodics and being given in a variety of pathological conditions. Atropine is also used as a mydriatic in ophthalmic practice.

StaffAllenS

have grown Belladonna and manufactured its preparations for practically a century. The freshly cut plants are handled in their "Factory in the Fields" before they have time to wilt and deteriorate.

BLACK SNAKEROOT ——— CANADA



Cimicifuga racemosa. Black Snakeroot.

Drawn from a plant cultivated in the Royal Gardens, Kew.

1. The whole plant, about $\frac{1}{15}$ nat. size. 2. Rhizome. 3. Portion of a leaf.
4. A raceme of flowers. 5. Inner, and 6. Outer sepal. 7. Petaloid stamen.
8. Pistil and half the stamens. 9. Anthers. 10. Pistil. 11. Vertical, and
12. Transverse section of the same. 13. Raceme of fruit. 14, 15, 16. A fruit.
17, 18. Seeds. 19. Vertical section of the same. (5-9, 11, 12, 14-16, 18, 19 enlarged).

Bentley & Trimen, *Medicinal Plants*, No. 8.

BLACK SNAKEROOT or Black Cohosh, Cimicifuga, (*Cimicifuga racemosa* Ell.), a tall herbaceous plant of the *Ranunculaceæ* family, grows abundantly in the woods of Canada and the United States. Cimicifuga was first mentioned, apparently, by Plukenet in 1696, under the designation of *Christophoriana Canadensis racemosa*. Colden recommended the drug in 1743, and Linnæus included it in his materia medica of 1749. Garden commenced using it medicinally in America in 1823 and the medicament was introduced into English therapeutics in 1860.

The rhizome, which is the part used in medicine, is perennial and is collected after the plant has fruited. It is then dried and cut up, to come on to the market in pieces about 4 cm. long. The diameter varies, being usually about 1 cm., the branches being about 3 cm. long. The root is distinguished from that of the somewhat similar plant black hellebore (*Helleborus niger*) by the fact that a Maltese Cross is displayed by four woody wedges in a section of the rootlets attached to the underside. Furthermore, its numerous stout branches also curve upwards.

The constituent which gives the drug its bitter taste is a crystalline substance racemosin. Cimicifuga, which appeared in the B.P. 1898, is given as a stomachic, in certain heart affections and in rheumatism and neuralgia.

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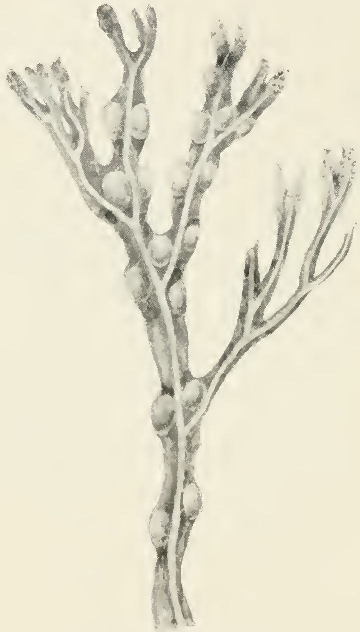
import Cimicifuga in large quantities and supply the medicinal preparations made from it in their factories.

BLADDERWRACK —— BRITISH ISLES



Bladderwrack

From the Dept. of Lands and Fisheries, Irish Free State

FUCUS VESICULOSUS of the Class *Algæ*, Order *Fucaceæ*, is one of the commonest seaweeds found on the shores of the British Isles, particularly on the Atlantic side. The entire plant is gathered for medicinal purposes. It earns its name from the bladder-like swellings (air-vesicles) arranged mostly in pairs on the branches of the thallus.

Bladderwrack contains a small amount of iodine, which is probably the most important therapeutic constituent. The iodine would appear to be present in a similar state to that in which it exists in the thyroid glands.

A Dublin medical practitioner apparently introduced seaweed to the notice of the profession in England in 1831, and it subsequently received attention in Germany.

Seaweed obtained from the Irish Coasts is to-day considered the most efficacious, but the plant has not been given official recognition. The drug is administered in certain cases of obesity.

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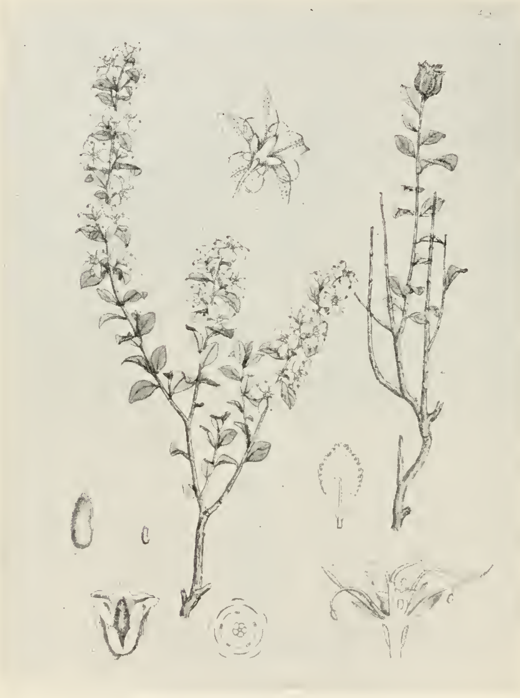
consume large quantities of Bladderwrack which they prepare for medicinal uses.

BUCHU —— SOUTH AFRICA



Barosma betulina.

Drawn from a Cape specimen in the British Museum, collected by Auge; the seeds added from Berg and Schmidt.

1 A flowering branch. 2. A branch bearing a solitary fruit. 3. Back view of a flower. 4. Vertical section of same. 5. Diagram of same (the petals should be imbricate). 6. Inside view of a coccus after dehiscence, showing the seed surrounded by the separated inner wall. 7, 8. Seed. 9. A leaf.

(3, 4, 6, 8, 9, enlarged).

BUCHU leaves are obtained from various species of *Barosma*, Fam. *Rutaceæ*, of which *B. betulina*, Bartling, "short" or "round" Buchu, is official, and *B. crenulata*, Hook., "oval" Buchu and *B. serratifolia*, Willd., "long" Buchu, are commercially important. There are, however, about sixteen species in all. *B. crenulata* and *B. betulina* grow in

Natives Collecting Buchu

(From the Department of Forestry, S. Africa).

the Clanwilliam and Worcester divisions, N. and N.E. of Cape Town, the former quite near Table Mountain and within a short distance of the city. *B. serratifolia* is found in Swellendam. All three species were admitted to the U.S.P. X̲. The plant, a small shrubby one, is a native of Cape Colony. The herb became known to the early colonists through the Hottentots, and was introduced to therapeutics in England by a London firm in 1821.

The leaves, which contain the medicinally valuable principles, are gathered when the plant is forming flower and fruit. They are dried, and exported from Cape Town. The elucidation of the therapeutically active principles of Buchu still leaves something to be desired. The chief constituents are a volatile oil and mucilage. The drug also contains a yellow crystalline substance, hesperidin, which does not apparently exert any physiological action. The volatile oil yields about 30 per cent. of a crystalline product, diosphenol, to which considerable importance is attached. The absence of this from so-called "long" Buchu resulted in the variety being excluded from the "B.P."

Buchu is considered to possess tonic diuretic properties and is given in certain internal inflammatory conditions. Large quantities are imported by America, where the drug is used in the manufacture of many proprietary medicines.

Oil of Buchu contains a ketone very similar to the menthone of peppermint oil. Its odour somewhat recalls that of the latter also, but is much less pleasant when pure—on dilution, however, quite an agreeable aroma is developed.

Buchu leaves grow wild, but experimental cultivation has been successful and promises to develop into a commercial proposition.

An interesting guide to the cultivation of Buchu was published by the National Botanic Gardens at Kirstenbosch, Newlands, Cape Province, in 1921, in the form of an *Economic Bulletin.*

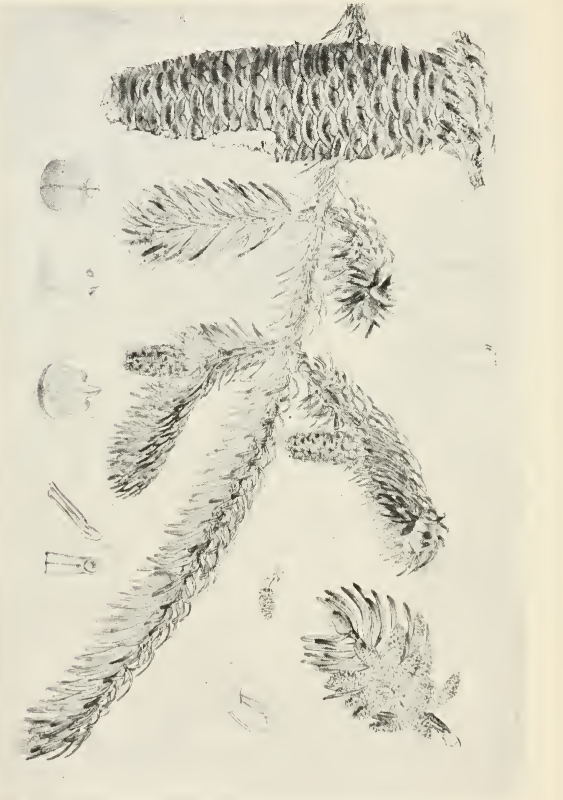
From this it would appear that a sunny slope such as that suitable for a vineyard, where there is plenty of rain but good drainage through the gradient, is the most favourable type of cultivation area. The ground generally requires trenching, harrowing and rolling. As the percentage of germination from seed is comparatively low, about 7 lb. is needed for an acre, the distance between each seed being about three inches. To obtain maximum foliage, the plant is cut down to a few inches from the ground after the first year, about 2 inches above this in the second year, and so on annually. In March or April, when the foliage has been washed clean, the leafy shoots are cut with a secateur. The shoots must not be torn or broken off, as this kills the plant. The leaves must be quickly and properly dried, which takes about a fortnight. Care has to be taken that no " sweating " occurs for a week or two before packing for export. The yield of volatile oil depends, it would seem, upon the carefulness exercised in drying.

The drug has figured in South African trade for decades and the annual amount now exported approaches 200,000 lbs.

StaffAllenS

import large amounts of Buchu and
manufacture all its preparations and
supply an excellent oil of Buchu.

CANADA BALSAM———CANADA



Abies balsamea Mill. (syn. *Pinus balsamea* Linn.)

Drawn from a cultivated specimen in the British Museum ; the male flowers and cone added from Lambert.

1. A twig with male catkins. 2. A single catkin. 3. An anther. 4. A branch with female flowers. 5. Upper—and 6. Under surface of a bract. 7. A ripe cone. 8, 9, 10. Scales of the cone with seeds. 11. A seed. 12. Base of leaves. (3, 5, 6, 12 enlarged).

The botanical name of the "Balsam Fir" or "Canada Balsam" given in Bentley & Trimen Med. Pl., No. 263, is *Pinus Balsamea* Linn., but the correct name is now *Abies balsamea* Mill.

CANADA BALSAM is afforded by *Abies balsameae* (L.), Miller (Fam. *Coniferæ*), Balsam fir, which is very similar to spruce fir. The tree grows to an average height of 30 feet and is widely distributed over Canada and Northern United States. The oleo-resin is collected on a large scale in lower Canada.

The drug would appear to have been known to the French, long before Canada became a British possession. Lewis mentions it in his *History of the Materia Medica* (1761) and it appeared in the London Pharmacopœia 1788. Gurney Bevan quotes its price as 4/- per lb. in 1776.

Terebinthina Canadensis, which was official in the B.P. 1914, is a clear, pale yellow, transparent liquid, with a honey-like viscidity and contains about 25 per cent volatile oil and about 75 per cent resin.

Collection is carried out to some extent by incision, but the balsam is also largely gathered by means of a spouted can, which serves the dual purpose of rupturing the globules of resin on the trunk and collecting the product. A superior method is that in which a glass syringe and rubber bulb are employed.

The main collection centre is the Northern Mountains near Montreal. Here, in the beginning of May, provided the weather is propitious, experienced gatherers proceed and billet themselves in the neighbourhood for a week or so. Collection is somewhat slow, the day's yield averaging possibly no more than a few pounds per man. Before being sold the product is filtered. The balsam is eventually placed in large containers and transferred to the port of shipment. Quebec and its environs, namely Jonquiere, Chicontimi and Beauce County are the market centres. Genuine Canada Balsam is almost entirely shipped from Montreal. That coming from New York is generally mixed with the Oregon variety.

Canada Balsam Tree
(From the Forest Service, Dept. of Interior, Canada)

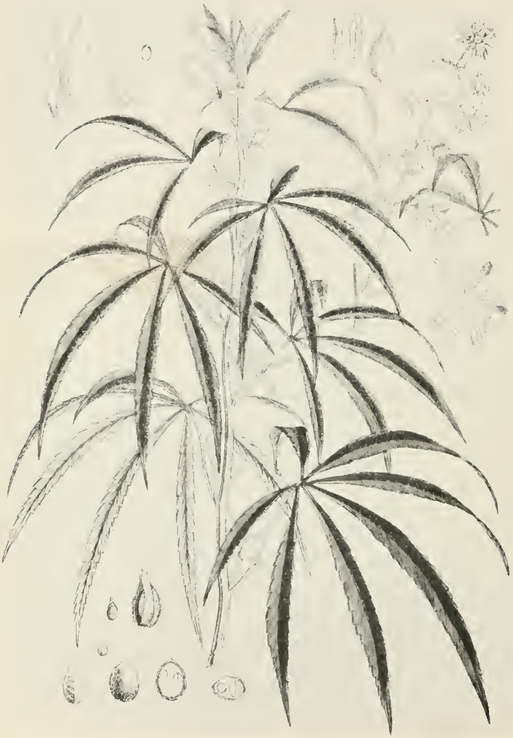
Canada Balsam is sometimes erroneously called Balm of Gilead, but this is derived from a shrub of the genus *Balsamodendron*, a native of Arabia. The drug possesses medicinal properties very similar to those of Balsam of Copaiba, but unlike the latter is rarely used in internal medicine of to-day. It does, however, enter into the composition of Collodium flexible B.P. 1914 plasters, and finds employment in optical work. Further, it provides a suitable mountant for microscopical objects, and has a wide use in the manufacture of certain paints and varnishes.

In connection with its use as a microscopic mounting medium and optical cement, some valuable work was done by Sir Herbert Jackson, K.B.E., F.R.S., F.I.C., of the British Scientific Instrument Research Association, as a result of which a preparation was evolved which was free from certain disadvantages inherent in the natural balsam. The manufacture of these preparations has been entrusted to Stafford Allen & Sons, who will be pleased to supply particulars to anyone interested.

StaffAllenS

handle considerable quantities of Canada Balsam and can supply a superior article.

CANNABIS INDICA ——— INDIA



Cannabis sativa, LINN. (syn. *C. indica* Lam).

Drawn from specimens grown in Kew Gardens.

1. Upper part of female plant. 2. A female flower. 3. Perianth unrolled. 4. Ovary. 5. Section of same. 6. A male pannicle. 7. A Bud. 8. A male flower. 9. Stamens. 10, 11. Fruit surrounded with the persistent perianth. 12, 13. Fruit. 14. Vertical, and 15, Transverse section of fruit. (2-5, 7-9, 11, 13-15).

CANNABIS INDICA, *Cannabis sativa*, Linn., Fam. *Urticaceæ,* is a native of the Caspian district, but is now spread all over temperate and tropical countries. It is only in tropical climates, especially India, however, that it produces the active resin, the variety yielding this being known as *Cannabis indica* Lam. In the B.P. 1914, that known as flat gunjah, or Chapta, was official. This is produced by trampling on the flowering tops, which results in a glutinous mass owing to the exudation of an oleo-resin. Bombay exports considerable quantities of this under the name guaza. A better quality product called round, or goli ganjah, is prepared by pressure and hand-rolling, which facilitates the retention of a larger amount of the resin. Unfortunately, the freshest material is appropriated by the natives, who are fully aware that the drug deteriorates on keeping. The previous year's crop is that which generally becomes exported. A volatile oil which is present in the fresh herb, and which gives the living plant its odour, is considered to cause the exciting effect.

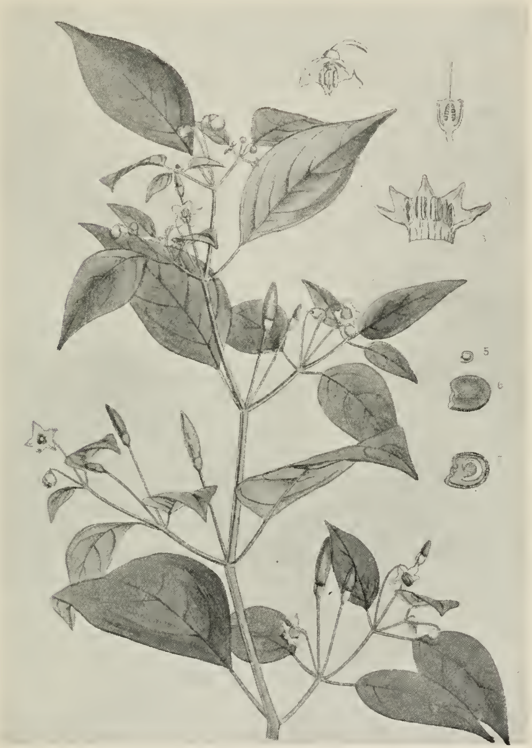
According to Sir David Prain, the soporific effect is attributable to the resin. The active principles of the plant, however, have not been thoroughly elucidated. The leaves are used for smoking in many parts of the world, as " Bhang " in India, as " Hashish " in Arabia and " Kief " in South Africa.

Indian hemp, as the drug is commonly called, has been employed for one purpose or another since remote times. Herodotus (5th century B.C.) seems to have been familiar with the intoxicating powers of the plant, whilst Dioscorides, Galen and Pliny all refer to it. Very early Hindu medical works mention the herb as " Bhanga," whilst the Chinese are believed to have employed it as an anæsthetic as far back as the third century. Certain Mohammedans, who fought very fiercely against the Crusaders, are stated to have taken their name " Hashishen " (later corrupted into assassins) from the Arabic word for the drug, " Hashish." Hassan ben Sabbah, mentioned in " Omar Khayyam " as a friend of Omar, apparently employed it to inspire his followers with enthusiasm for his sanguinary enterprises. From this time onwards, most writers in the East refer to the widespread employment of the herb, which produced astonishing intoxicating effects. These have never been witnessed in temperate climates, and although the product has been introduced into western medicine, it has nowadays ceased to be employed to any degree, on account of its uncertain action and poisonous nature.

StaffAllenS

manufacture Cannabis Indica preparations.

CAPSICUM——E. & W. AFRICA



Capsicum frutescens.

Drawn from a specimen in the British Museum collected by Horsfield in the island of Banka.

1. Part of a plant in flower and fruit. 2. A flower. 3. Corolla laid open: 4. Section of calyx and pistil: 5, 6. Seed. 7. Section of same. (2-4, 6, 7, enlarged).

CAPSICUM would appear to be of American origin, there being no name for it in Sanskrit or Chinese. Springel, however, states his belief that the piperites of Pliny must refer to *Capsicum annuum.* The first authentic reference to the spice is made in a letter by Chanca, physician to Columbus on his second voyage to the West Indies, and written to the Chapter of Seville. He named the plant " Agi " (1496), the present name for Capsicum in Spanish.

There are about 30 species of Capsicum, Fam. *Solanaceae,* of which *Capsicum minimum* only is official in the B.P. It is mainly produced in East and West Africa and India. The fruits are generally about half an inch long and of a dull-red appearance and are commercially known as chillies. *C. frutescens* is another similar species, also largely cultivated in the tropical parts of the Empire. Some modern botanists actually consider the species identical and use the description *C. frutescens* only. Other species of Capsicum include *C. annuum,* common or annual Capsicum, which produces fruit 2 or 3 inches in length and is less pungent than the above. *C. tetragonum,* or bonnet pepper, is popular in Jamaica. *C. cerasiforme,* cherry pepper, consists of small berries instead of pods. *C. grossum,* or bell pepper, is used in pickling and *C. baccatum,* bird pepper, is given to canaries to intensify the colour of their feathers.

In international commerce, Capsicum comprises a group of the red peppers (all species of capsicum) which also includes chillies and paprika. Chillies are the small, very pungent fruits. These when ground are generally known as cayenne pepper. Capsicum refers to the larger fruit of this species and when ground is often termed red pepper. Paprika is the fruit of *Capsicum annuum* and other large varieties. There are so-called " hot " and " sweet " grades, the latter being far more generally used. These are natives of Italy, Spain, Hungary and Southern Europe generally. They are usually large and very mild and are in common use as comestibles in many countries.

Africa and India are the main British sources of capsicum. Zanzibar, Mombasa, Natal, Sierra Leone, Bombay, Madras and Tellicherry have all given their names to the spice. They are often associated with both " chillies " and " capsicums."

Zanzibar chillies come from the island of that name ; Mombasa from British Central Africa. Sierra Leone chillies emanate from the Niger River district, whilst Sierra Leone capsicums are said to be produced in the N.W. Sudan. Nyassaland chillies and capsicums come from the Nyassa Lake Territory. Natal Capsicums are the produce of the country, and the Bombay, Madras and Tellicherry varieties of capsicum all owe their designation to their respective district of origin.

Capsicum, in addition to its extensive use everywhere as a spice and condiment, is employed in internal medicine as a tonic stomachic and externally as a stimulant. Capsicin, its active principle, is also used to give increased pungency to ginger ales and ginger wines, and more extensively in sauce manufacture.

StaffAllenS

are favourably placed to quote for all varieties of Capsicum, for the oleo-resin and for capsicin, both of which are made in their factories.

CARDAMOMS —— INDIA

GATHERING CARDAMOMS

(From the Imperial Institute Collection)

CARDAMOMS have a long history. They were known to the ancients, used medicinally by Hippocrates, and were a trade spice from at least the second century A.D. However, it is probable that the Cardamom in favour to-day is not the same variety as that referred to by Greek and Roman writers.

Elettaria Cardamomum, Maton (Fam. *Scitaminaceæ* is the plant whose seeds are used in modern pharmacy and confectionery. The words Cardamom and Amomum are from the Greek and Latin, Elettaria being derived from the Sanskrit " Eta," by derivatives of which the spice has been known in India for centuries. The plant is indigenous to Southern India, is cultivated there (Malabar Coast) and in Ceylon. Several varieties are recognised, the commercially valuable being Mysore, Malabar, Mangalore and Ceylon. The first mentioned is exported to the largest extent. Microscopical examination must often be made in order to identify the different varieties. The seeds owe their aromatic properties to a volatile oil which is employed in perfumery and as a flavouring agent.

Care has to be exercised by the natives in collecting Cardamom so as to avoid picking over-ripe fruit, which split in drying. A special scissors is employed by which the fruit, with a portion of stalk, is cut off. About 10 lbs. is the average weight of fruit picked by a coolie in a day. Both the fruits and the seeds extracted from them are exported.

Cardamom is official in the B.P., and in other pharmacopœias. It is prescribed as an aromatic and for its cordial and stimulant properties.

Large quantities of the fruit are used on the Continent in confectionery.

StaffAllenS

handle large quantities of Cardamom fruits and seeds which they use in the manufacture of official and unofficial preparations of the drug as well as for the distillation of the essential oil.

CASCARA —— CANADA

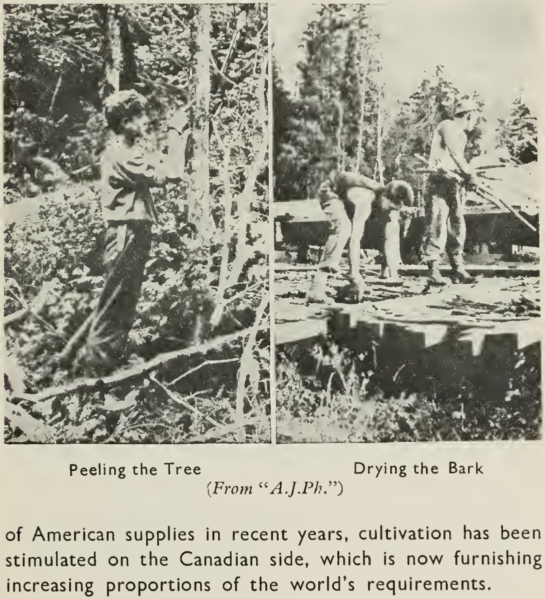
Plantation of Young Cascara Trees
*By courtesy of Prof. Starker**

CASCARA SAGRADA (true cascara) is the bark of *Rhamnus Purshianus* D.C. (Fam. *Rhamneæ*), a tree indigenous to California, and found distributed along the Pacific Coast, in Oregon, Washington and British Columbia. It was discovered by an exploring party in 1805.

* *See A.J.Ph., Vol.* 103, *Nos.* 2 *and* 3.

According to tradition the plant was known to the Mexican and Spanish priests of ancient California, its name, which means "Sacred Bark," arising from the fact that it was considered identical with the "Shittim" tree of the Old Testament.

In Canada the commercially important areas of Cascara are mainly the Lower Fraser River Valley and the eastern part of Vancouver Island. Owing to the partial depletion of American supplies in recent years, cultivation has been stimulated on the Canadian side, which is now furnishing increasing proportions of the world's requirements.



Peeling the Tree Drying the Bark

(From "A.J.Ph.")

Collection of the bark takes place from mid-April to the end of August, when the tree is in full leaf, but before peeling begins. The largest amount is obtained from the mountains, whence it is brought to the drying districts and peeling sheds. The large strips of the peeled bark are dried in the sun. A good worker can peel on an average 150 pounds or more per day. The bark requires a period of years thoroughly to mature for use in medicine.

Although varieties of *Rhamnus*, including *R. californicus*, must have been used from an early period, Cascara Purshianus was introduced into therapeutics as an ethical medicament in 1877, the introduction being mainly due to the action of certain commercial drug houses. Since its inclusion in the various pharmacopœias, Cascara has enjoyed a wide vogue, maintaining its reputation as an efficient vegetable laxative. Its exact chemical composition has not been determined, but a number of active constituents has been isolated from it.

StaffAllenS

possess facilities for importing and maturing true Cascara Bark and manufacture preparations of it on a large scale in their factories.

CASTOREUM ——— CANADA

Beaver—*Castor fiber*
(From office of the High Commissioner of Canada)

CASTOREUM is a characteristic substance, being the desiccated preputial or vaginal follicles of the Beaver *Castor fiber*. Linn., *Order. Rodentia*, a rodent inhabiting North America, particularly the Hudson's Bay Territory, but it is also found in Siberia. Dried glands from both male and female are used. In commerce the drug appears as a dark brown or greyish pear-shaped mass about 3 inches long, pairs being common. The glands are solid, firm and ponderous, and possess a characteristic odour. Internally they display a multitude of cells, which yield a yellowish exudation in the fresh gland. This darkens in the course of time. Accordingly, the colour and consistence of the contents vary considerably. The chief constituent is a resinous matter, which is present to the extent of about 60 per cent. Its chemical composition, however, has not been completely elucidated. The drug is used in dysmenorrhœa, having a marked effect on the circulation and blood pressure. It may be exhibited as Tinctura Castorei, but it is preferable to give it in the form of capsules in order to mask its nauseous flavour. It is, however, more largely used in perfumery than in medicine.

At one time considerable amounts of Russian Castoreum came on to the market, but to-day supplies emanate almost exclusively from the Hudson's Bay Territory.

StaffAllenS

handle in the year's course even the very rarely used medicaments such as Castoreum

CASTOR OIL——INDIA

CASTOR OIL PLANTS, SOUTH INDIA

R*ICINUS communis* Linn., *Palma Christi,* Fam. *Euphorbiaceæ,* from which Castor Oil is obtained, was known in very early times. Seeds of the plant have been found in Egyptian sarcophagi. Both Herodotus and Hippocrates refer to it, whilst it was familiar to the Romans, who gave it the designation "*ricinus*" on account of the similarity of the seeds to the insect infesting some animals, known in England as the "Tick." The Kikajon or gourd of the Old Testament is considered to be the same plant.

The tree, which frequently grows to a height of 40 feet in India, where it is indigenous, is also found as a smaller variety in many other tropical and sub-tropical regions, including the Mediterranean.

British India would appear to supply practically all the seed entering the world markets. The decline in the export of the seed from India just after the War, in favour of Brazil, has ceased, and very high totals are again being reached. The increased demand during the War promoted a good deal of experimental cultivation of Castor in various countries, but the results have not seriously interfered with the former international position. The previous export of Castor Oil from India (as much as 2,664,900 gallons in 1889) has in recent times given way to the almost exclusive shipment of seeds. The oil which is still pressed there is chiefly used for home consumption, mainly for lubricating and lighting purposes. Medicinal Castor Oil is produced in the chief European countries and the U.S.A. ; only cold drawn oil of the first expression is so employed. The seeds are graded and placed between rollers, where the shells are broken and blown away by an air-blast. The kernels are then pressed hydraulically to obtain the oil.

Apart from its use in medicine, Castor Oil of lower grade, produced by secondary " hot " pressing, is extensively used as a leather dressing and for the production of Turkey red oil. Of recent years there has been a large market for the commodity as a component of lubricants, particularly in connection with the internal combustion engine. Large amounts of Castor Oil are expressed from seed in London and Hull ; all varieties being produced, including medicinal, which is, of course, employed as a purgative.

StaffAllenS

can quote favourably for finest cold drawn medicinal Castor Oil.

CATECHU
FEDERATED MALAY STATES

Gambier Factory, Singapore
(From Kew Gardens Collection)

TWO SUBSTANCES often confused under the name Catechu are Gambier, pale catechu, extracted from *Uncaria Gambier*, Fam. *Rubiaceæ* and Cutch, black Catechu, obtained from the heartwood of *Acacia Catechu*, Fam. *Leguminosæ*. The plant yielding Gambier is a climbing shrub indigenous to the Malay Peninsula and largely cultivated there. Gambier is considered to have been employed as a masticatory in place of betel leaf since remote times. The product has been manufactured on a large scale in the neighbourhood of Singapore for over a century. It is also a product of Borneo.

Dioscorides has been thought to have referred to Catechu, but the earliest mention now regarded as authentic is that of Rumphius, who lived at Amboyna in the late 16th century. Gambier first came to Europe in the latter part of the 18th century.

Gambier should be carefully distinguished from Cutch, which, although of similar chemical composition, contains none of the fluorescent substance found in the former. It is obtained from a fair-sized tree native to India and Burma. " Gambier " is Malay for an extract from the leaves of a shrub, whilst " Catechu " is derived from *Cate*=a tree and *Chu*=juice.

Gambier is generally found in commerce in the form of square cakes or one inch cubes. The product is made by boiling the young shoots and leaves of the plant in water and evaporating to a syrupy consistence in a copper pan, the liquor being continually stirred to assist crystallisation and finally produce a clay-like mass. In this state the commodity is conveyed from the source of production to Singapore, where it is cut into small pieces of various shapes, of which the cube variety is commonly employed in pharmacy. The principal chemical constituents of both Gambier and Cutch are catechin and catechutannic acid.

Gambier only is employed in medicine, chiefly as an astringent in lozenges. It is, however, also used to a much greater extent, as Cutch exclusively is, in the dyeing and tanning industries.

StaffAllenS

import and grind Catechu and offer
superior preparations.

CHAMOMILE ——— ENGLAND

A Field of Chamomile on StaffAllenS Farms at Long Melford

ANTHEMIS nobilis Linn., Fam. *Compositæ*, the common or Roman Chamomile, grows wild in Europe generally and has been cultivated in England for centuries. It is impossible to say whether the herb was actually known to the ancients, although similar plants are described by old Greek writers, on account of the large number of such plants possessing like inflorescence. It received its official name from Tragus, 1552, and the further qualification Roman from Camerarius, who found the plant flourishing near Rome in 1598.

Considerable quantities were under cultivation at

Mitcham over a century ago, the supplies being exclusively requisitioned by the Society of Apothecaries for a long period, ending in 1851.

The plant is cultivated extensively at Long Melford. Owing to the risk of adverse weather during the flowering period and the comparatively high labour costs in gathering the crop, the plant is grown in England principally for the oil and extract, and not for the flowers.

The distilled oil is of a deep blue colour, due to the presence of a hydrocarbon, azulene, which is readily oxidised and changed by light, turning yellow. Distillation of the fresh flowers as they are brought in from the fields yields an oil of fragrance superior to that made from dried flowers. It should be noted that on the European continent the name of Common Chamomile is given to the plant *Matricaria Chamomilla*, which elsewhere is called German Chamomile, and the oil from this is different and much less pleasant.

Infusion of Chamomile is employed in medicine as a tonic stomachic ; the essential oil is an important ingredient of fine liqueurs. Recently there has been an increased demand for Chamomile in hair preparations.

StaffAllenS

grow Chamomile on their Herb Farms at Long Melford, distil the oil and manufacture the extract.

CINCHONA ——— INDIA

Cinchona Plants, Munsong Plantation, India
(*From the Kew Gardens Collection*)

CINCHONA or Peruvian Bark, *Cortex Cinchona*, Fam. *Rubiaceæ*, is obtained from several species of evergreen trees, indigenous to South America, particularly portions of Venezuela, Ecuador, Bolivia and Peru.

Although tradition says that Cinchona was used medicinally by the aborigines of Peru, the first recorded use concerns the cure of a Jesuit missionary by an Indian Cacique at Malacas in 1600. The drug apparently owes its introduction into Europe to a *cause celèbre*—the successful treatment of a famous Spanish beauty, the Countess Chinchon (of which Cinchona is a corrupted derivation) who suffered an attack of fever in Lima at the time her husband was Viceroy of Peru.

Up to about 1850, the world's supply of Cinchona came from South America, but its cultivation was then actively taken up in the British and Dutch East Indies. At first, India was the more successful and for some time, until about the last decade of the century, dominated the markets. However, through scientific cultivation of a superior species of plant brought to Europe by an Englishman, Chas. Ledger, Java has outstripped India, both in quality and quantity of output, so that to-day she largely monopolises the drug, and Amsterdam has replaced London as the centre of the quinine market. Nevertheless, India continues to produce Cinchona for the supply of febrifuges to the natives, and some finds its way to outside markets.

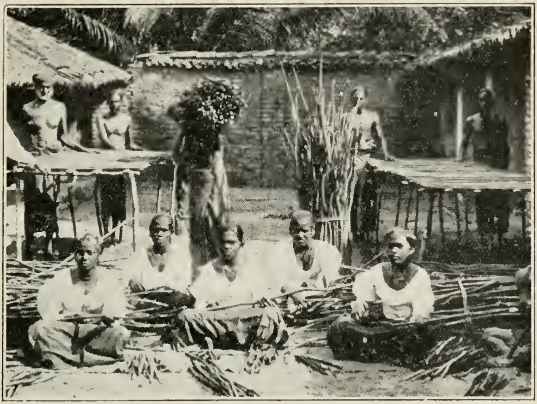
The Government of India possesses a large Cinchona plantation in the Mergui District, Burmah, which has an annual production of over 100,000 lbs. and Quinine Sulphate is manufactured on a large scale at the Bengal and Madras factories.

Quinine is, of course, the best known and most important constituent of Cinchona, but altogether 30 alkaloids have been isolated. The drug has achieved world-wide fame. Combined with control of the mosquito, its use has largely conquered the scourge of malaria and materially assisted in the advance of white civilization in the great tropical areas of the British Empire and other parts of the world.

StaffAllenS

manufacture preparations of Cinchona and can quote advantageously.

CINNAMON ——— CEYLON



Slitting and Rubbing Cinnamon Bark, Ceylon
(From the Imperial Institute Collection)

CINNAMON Bark is obtained from *Cinnamomum Zeylanicum* Nees (Breyn), a tree of the *Lauraceæ* family. It is indigenous to Ceylon, from which most of the bark of commerce is obtained, but it is also cultivated in India, Mauritius, Seychelles and Jamaica. The trees average 20 feet in height, but sometimes reach 40 feet. They favour sandy or clayey soil, and are usually found on slopes and open spaces up to 1,500 feet. The bark is obtained from leafy shoots which grow from the tree stump. Portions of the bark about 1 ft. in length are cut and slit lengthwise with an instrument known as a "Mama," friction with the handle being applied in order to facilitate removal of the bark. Strips remain exposed in heaps for 24 hours, then each strip is stretched and the epidermis and cortex carefully scraped off. The strips are then packed one inside the other to form Compound Quills. The bark is put in the shade for a short time, dried in the sun in trays and packed in bundles. The slender portions are previously cut off and sold as chips or used in the distillation of Cinnamon Oil.

Cinnamon obtained from Ceylon is superior to other varieties, but Tellicherry and Malabar or Tinnevelly, both produced in Southern India, are also widely employed.

Cinnamon is chiefly employed as a spice, but it is also used in manufacturing incense, whilst its cordial stimulant properties have found for it a place in pharmaceutical preparations. Cinnamon oil, as used in medicine, is the essential oil obtained from the bark. As an intestinal astringent, it has proved of value in common and influenza colds.

The main body contained in Cinnamon oil is cinnamic aldehyde, but this is not separated from the oil and used as such. The synthetic aldehyde, however, which is greatly inferior to the English distilled natural oil, is used in perfumery and as a flavouring agent, where cost is of more importance than quality.

Cinnamon and Cassia are probably amongst the oldest spices—ancient Hebrew, Greek and Roman works all testify to the high regard in which these substances were held. Their similarity was commented upon by Galen, who considered a double quantity of the best cassia equal in value to a given amount of low quality cinnamon.

In early times, Arabia and Eastern Africa were the chief sources of supply and in the commerce between these countries and Venice during the Middle Ages, Cinnamon was a most important article. Ceylon was occupied by the Portuguese in 1536 on account of its wealth of Cinnamon, they having discovered the island through circumnavigation of the Cape of Good Hope thirty years previously. A century after this, the Cinnamon trade of Ceylon became a monopoly of the Dutch East India Company and continued to be until the English obtained possession more than a hundred years later in 1796, when it passed over to the English East India Company. During the period of Dutch occupation, cultivation was commenced with remarkable success.

Cinnamon was employed in most parts of Europe well before the close of the first millennium of our present era. It figures in particular in a certain Frankish document connected with a monastery in Normandy. Later it apparently became somewhat scarce, being considered suitable for a New Year's gift to Queen Elizabeth.

It is interesting to note that Essential Oil of Cinnamon would appear to have been distilled in the East as far back as the middle of the 16th century, and it is still distilled to a large extent on the island of Ceylon.

StaffAllenS

have been importers of Cinnamon Bark and distillers of Cinnamon Oil for almost a century and are particularly well placed to supply both.

CITRONELLA ——— CEYLON

1 CUTTING CITRONELLA GRASS

(From the Imperial Institute Collection)

CITRONELLA OIL, CEYLON, one of the two chief varieties known in commerce (the other being Java Citronella), is distilled from *Cymbopogon Nardus*, Rendle, Fam. *Gramineæ* (Lanu Bata grass).

There is a tradition that Citronella was known to the ancients, but it has at least been in use for some centuries. Nicolaus Grimm, a physician in Colombo at the close of the 17th century, knew that the grass grew abundantly in the neighbourhood and that a volatile oil was distilled from it. Citronella is found wild in Ceylon only, being also cultivated there (Southern Ceylon). Cultivation has spread in recent years to the West Indies, the Seychelles and the South Sea Islands. The plant is also said to occur in tropical East Africa.

The freshly cut grass is not used, as it yields an oil of disagreeable odour. Only well dried grass is therefore distilled. Care has to be exercised in drying in order to avoid fermentation and decomposition. In general, the grass is cut three but occasionally four times a year. About 60 or 70 lbs. of oil per acre are obtained as an average yield. Owing to the necessity for the plentiful supply of cool water, the distilleries are usually located at the foot of a range of hills, where the desired conditions obtain. Distillation is mainly in the hands of natives, who display remarkable aptitude for the work. Direct steam distillation is employed, the oil collecting in a receiver which is locked and carefully safeguarded. Citronella is one of the most important essential oils produced within the Empire, which has supplied increasingly large quantities in recent years. It is extensively used in perfumery—in soaps, hair preparations and skin lotions and is the raw material from which geraniol is produced.

BRINGING CITRONELLA GRASS TO FACTORY

(From the Imperial Institute Collection)

StaffAllenS

handle large quantities of Citronella Oil and manufacture the important isolates Geraniol, Citronellol and Citronellal from it.

CLOVE ——— ZANZIBAR

Collecting Cloves, Zanzibar
(From the Imperial Institute)

THE CLOVE TREE, *Eugenia caryophyllata*, Thunberg, (*Caryophylla aromatica*) Fam. *Myrtaceæ*, is an evergreen, growing to 40 feet. It was originally native to a group of five small islands, Moluccas or Clove Islands, between Celebes and New Guinea.

The spice is no longer produced there, having been introduced successively to the Amboynas, Cayenne and eventually (by an Arab) to Zanzibar, where cultivation has been very successful for over a century and which, for some time, has supplied most of the cloves on the market.

Cloves were known to the Chinese centuries ago, and it is possible that Καρυσφνλλον is a Hellenised form of an ancient Asiatic name for the plant. Pliny apparently is the first Continental writer to refer to Caryophyllon. Cloves were becoming well known in Europe by the 4th century ; they figured in a presentation by the Emperor

Constantine to the Bishop of Rome. From this time onward the trade in spices greatly increased and Cloves became one of the most highly valued. It is mentioned in household records of English noblemen as far back as the 13th century.

Some time in the 18th century an Arab introduced the Clove Tree to Zanzibar, and its cultivation has flourished

Cloves drying on mats. Govt. Plantations, Lupani, Pemba
(From the Imperial Institute Collection)

there ever since, so much so that most of the worl
of Cloves comes from this British Protectorat

Cultivation is in the hands of the Gov
flower buds are gathered by hand, a mob
trees' height being employed. The
bi-annually in Zanzibar and Pemba, fr

The discovery that Vanillin could be profitably manufactured from Eugenol, the chief constituent of Clove Oil, gave an immense impetus to the demand for the latter and to-day, tons of the oil are distilled where pounds were formerly.

Zanzibar and Pemba provide about three-quarters of the world's supply of cloves, whilst the remainder is chiefly made up of the Amboyna and Penang varieties. All these territories are under the British Flag. Penang are considered to rank first (this applies to the quality of oil yielded) Amboyna second, and Zanzibar and Pemba third.

Bales of Cloves awaiting shipment.
(From the Imperial Institute Collection)

It has been claimed for clove from the medical standpoint that it possesses antiseptic properties—that it, mustard and cinnamon arrest the development of micro-organic life in foodstuffs. Other spices such as mace, nutmeg and allspice are believed to delay process of decomposition but pepper, ginger and cayenne are stated to be inert. There is no doubt that oil of cloves has very marked antiseptic properties.

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began distillation of Clove Oil at Cowper Street, Finsbury, about 1833. As Allen's English Oil of Cloves it acquired a world-wide reputation.

COD-LIVER OIL
NEWFOUNDLAND, SCOTLAND

Hauling a Cod Trap, Newfoundland.
(By Courtesy of W. A. Munn, Esq., St. Johns.)

COD-LIVER OIL is obtained from the liver of the cod, *Gadus morrhua*, Linn., Fam. *Teleostei*, which is caught in shoals off the Norwegian, Newfoundland and other northern coasts. The two countries mentioned form the chief centres of the industry. Newfoundland, the chief source within this series, may have been discovered by the Vikings about 1,000 A.D.—descriptions of "Winland" in the sagas of the Northmen tallying very closely with it. Cabot, however, took possession of the territory in 1497 in the name of Henry vii, calling it Baccalaos on account of the prolific amount of Cod Fish in the surrounding waters.

It would appear that the medicinal properties of the oil obtained from the creamy coloured cod liver were known in very early times, being so employed by the inhabitants of Greenland, Lapland and other northern countries. That great store was set upon Cabot's discovery by the prescient of the day is instanced by Bacon's prophecy " that the fisheries of the Island (Newfoundland) were richer than the mines and treasures of Golconda and Peru."

Until comparatively recent times cod-liver oil was a very crude product. The first step towards improving its quality was taken by an English chemist, Charles Fox, who utilised heat in extracting the oil. Forty years later, in 1888, Adolph Neilson, a Government Inspector, introduced a process which chilled the oil and eliminated the " stearine."

Since 1903 the modern method of steam refining has replaced the older ways of preparing the oil and has resulted in the industry being placed on a scientific basis.

Following these developments in production, recent research on the medicinal value of the oil has resulted in the conversion of its administration in many diseases, tuberculosis and rickets in particular, from an empirical to a scientific therapy.

The discovery, first of the importance to diet of the accessory food factors—vitamins A, B, C, D and E and secondly that Cod-Liver Oil is one of the richest natural sources of vitamins A (anti-infective) and D (anti-rachitic) has greatly enhanced the reputation and increased the consumption of the oil.

Quite recently two well-known authorities, Professors Drummond and Hilditch, have demonstrated the superiority of Newfoundland Cod-Liver Oil, which should encourage wider use of this important product of the oldest Colony in the Empire.

The oil obtained from the liver of the cod has been described by no less an authority than the Secretary of the British Medical Association, as " literally bottled sunlight."

That sunlight possesses great curative properties in many diseases has long been known, but it is only recently that certain of its rays—the invisible ultra-violet rays—

have been discovered to be responsible for this. These rays act upon a substance known as cholesterol, in the skin, and produce Vitamin D, which enables the body to absorb the vital elements calcium and phosphorus.

Vitamin D can be produced artificially in many ways, by the mercury vapour lamp, by the arc lamp and by the irradiation of cholesterol, and of ergosterol—the latter being the most recently discovered method. However, Cod Liver Oil remains the richest natural source of both Vitamins A and D.

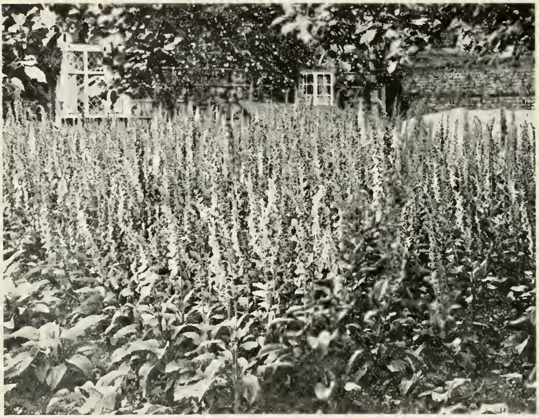
Professor Drummond, who has been previously mentioned, demonstrated some time ago that the diatoms on the sea surface can elaborate vitamins direct from sunlight. These diatoms form the food of animal plankton eaten by the smaller fish which, in turn, constitute the diet of the great cod. By this means, the substances produced by minute maritime life find their way to the liver of the cod, which possesses the peculiar property of being able to store them so that, in fact, the cod's liver becomes a reservoir of vitamins.

Many diseases are caused by a deficiency of vitamins, Rickets in particular, and in these the administration of Cod-Liver Oil has been proved to be of enormous value.

Cod-Liver Oil is also produced at Aberdeen from fish caught in the North Sea. The fish are taken from the sea and within an hour the livers are being treated for removal of the oil, which is packed into barrels ready for unloading when the vessel reaches port. It is then tested and graded.

❧

DIGITALIS ——— ENGLAND



Foxgloves growing for seed at Long Melford

DIGITALIS was in all probability known to the ancients, but there would not appear to be any incontrovertible evidence to this effect. The Physicians of Myddvai (Meddygan Myddfai), *circa* 1233, are known to have prescribed it. Fuchsius (1542) is generally considered to have named the plant Digitalis, from the resemblance of the blossoms to a fingerstall (German, *Fingerhut*). The common name Foxglove is stated to be derived from the old Saxon " Foxesglew," meaning fox music and alluding to an old musical instrument with bells on an arch-like support. The plant, a biennial or perennial, grows wild in all parts of England and is cultivated for medicinal purposes in Suffolk.

Digitalis purpurea, Linn., Fam. *Scrophularineæ* owes its therapeutic activity to the glucosides found in the leaves and seeds. Much confusion has existed regarding their pharmacology and nomenclature—the position, as with a number of other drugs of vegetable origin, being aggravated in the past by the uncertain pharmacological action of the medicinal preparations. However, recent research and the method of biological assay which has been adopted by reputable manufacturers of Digitalis preparations have gone far to improve matters and it is now possible to obtain products of known and constant physiological effect.

The medicinally important glucosides are digitoxin (insoluble when pure in water) and gitalin (formerly known as digitalein). A further amorphous constituent, digitonin, a glucosidal saponin, assists solution of the digitoxin in infusion. Although the wild plant is employed, cultivation from seed ensures the true type of *Digitalis purpurea* being used and facilitates rapid collection and drying, which favour a higher yield in the glucosidal values.

Digitalis possesses peculiar pharmacological properties and exerts at least six distinct actions on the heart and circulatory system. It is administered as a specific in cardiac disease, particularly in the disorder known as auricular fibrillation.

The necessity for employing digitalis preparations of known and constant therapeutic effect becomes evident when it is realised that the drug is used to produce through definite dosage, a condition known as " digitalisation," after which administration must cease for a period.

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grow Digitalis purpurea and offer their carefully selected, scientifically prepared leaf, which is biologically assayed in the Pharmacological Laboratory of the Pharmaceutical Society of Great Britain. It is packed in airtight tins bearing the Society's certificate for its exact potency in terms of the International Standard, fixed by the Geneva Conference. The tinctures official in the various pharmacopœias are also made and issued with similar certificates of physiological activity.

DILL ——— ENGLAND

Dill Reaping at Long Melford

P*EUCEDANUM graveolens* Benth. & Hook. Fam. *Umbelliferæ*, an annual plant similar in appearance to fennel, is indigenous to Southern Europe and is cultivated in England. Dill is considered to have been mentioned by the ancient writers and to appear in the New Testament. Along with fennel, cummin and coriander, dill was commonly merchanted in Anglo-Saxon times, it being suggested that the name derives from the old Norse word dilla, to lull, in token of its carminative effect. It was referred to by Alfric, Archbishop of Canterbury, in the 10th century.

Stafford Allen & Sons cultivate the herb on their medicinal plant farms at Long Melford. The seed is sown in March and the plant matures in August. Before gathering the dried fruits the plants are cut down close to the base and are set up in shocks in the same way as corn, the fruit ripens thus uniformly without risk of injury. When mature the fruit is thrashed and all the umbels and immature fruit are carefully separated, so that the oil obtained has a pleasant characteristic odour free from any rankness.

English dill has distinct advantages over that of foreign origin, particularly over Indian which, although once imported in quantity, is practically discarded nowadays on account of its having been found to contain dill apiol—a somewhat toxic constituent.

Distillation is usually carried out about the end of August. The distilled water of dill possesses stomachic and carminative properties and is prescribed for infant troubles, and is also employed as a vehicle for various medicaments.

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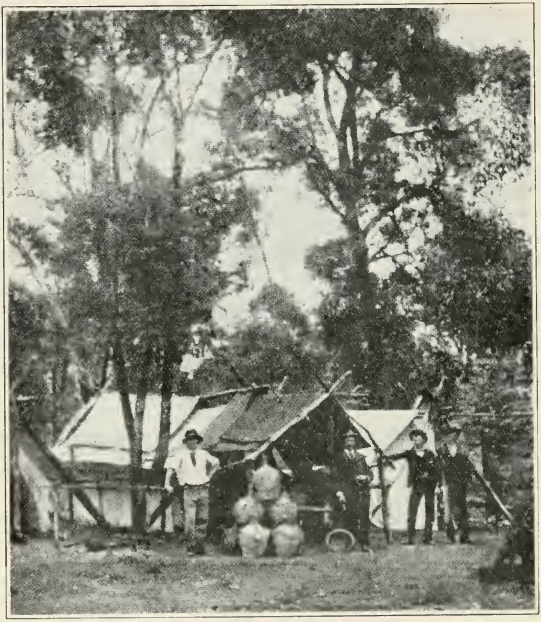
have a considerable acreage of their Herb Farms under Dill and can quote favourably for superior products.

EUCALYPTUS ——— AUSTRALIA



Eucalyptus Distillers' Camp in N.S.W., Australia
(From the Kew Gardens Collection)

THE GENUS EUCALYPTUS, Fam. *Myrtaceæ*, is of immense importance as a source of timber, essential oils and kinos. Its trees probably form three-quarters of the vegetation of the Australian Continent, which extends over 3,000,000 square miles. Its main interest to the pharmacist is, of course, as a source of the well-known eucalyptus oil. Eucalyptus Oil is obtained by distilling the fresh leaves of a number of varieties of Eucalyptus, so that actually the name Eucalyptus Oil has very little meaning from a scientific standpoint. Nowadays several groups are recognised, (1) Oils for medicinal purposes contain large amounts of cineol or eucalyptol ; (2) Oils for industrial purposes contain principally terpenes and are employed in flotation processes for the extraction of ores in mining. *E. amygdalina* is, perhaps, the most important member of this group. (3) Oils which on account of their aroma enter into perfumery. *Eucalyptus citriodora* is representative of this class. Although *E. Globulus* is mentioned in the B.P., its odour is inferior to that of many other varieties.

The industrial oils are probably obtained from other parts of the plant besides the leaves. In *E. citriodora* there is about 90 per cent. citronellal. For some time past *E. polybracta* and *E. Smithii* have been largely distilled for medicinal oil and to a less extent *E. Australiana.*

Some while ago attention was paid to *E. piperata, E. dives* and similar varieties which yield the ketone, piperitone. The latter is used for making synthetic thymol and may be employed for making synthetic menthol, but manufacture on a commercial scale has not yet apparently materialised.

Through its antiseptic properties Eucalyptus Oil has obtained wide use as the chief ingredient in sprays and inhalants for colds and affections of the respiratory tract. It has been stated to act specifically in Malaria and certain fevers. Most of the world's supply of the oil is derived from Australia and Tasmania.

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handle and rectify large quantities of Eucalyptus Oil and manufacture cineol, the isolate which is obtained from it.

GINGER ——— JAMAICA, B.W.I.

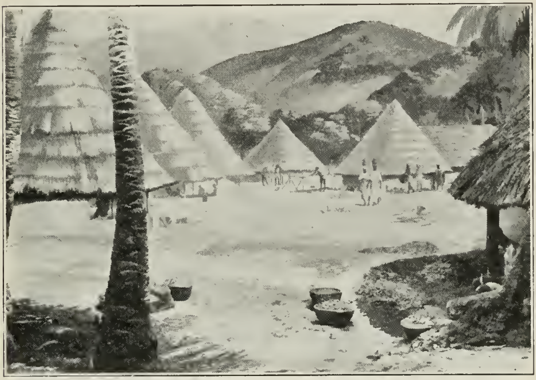
Peeling Ginger (Jamaica) B.W.I.
(From the Imperial Institute Collection)

GINGER, *Zingiber officinale*, Roscoe, Fam. *Scitaminaceæ*, was known to the Greeks and Romans and was used in England before the Conquest. In those days the source of supply was India ; however, about the 15th century the plant was introduced to the B.W.I., and the best variety, Jamaica Ginger, has been cultivated there ever since.

Of the other varieties three important ones come from within the Empire, namely, East Indian or Bengal ; Cochin from the Malabar Coast, and West African, chiefly from Sierra Leone. The last, formerly one of the poorest varieties, has improved in appearance in recent times through the efforts of the African trader, so that it now more resembles Japanese, the chief other commercial variety.

Jamaica Ginger easily possesses the finest and most agreeable odour, and is the only one official in the B.P. It is described in commerce as "Scraped Unbleached Ginger."

The aroma of Ginger is due to a volatile oil of complex composition, and the pungency to a mixture of phenolic substances, forming the oily body called gingerol. Together with resins these principles compose the important product, known as oleo-resin of ginger, which is far and away the most important preparation made from ginger to-day. Ginger, apart from its wide use as a culinary spice and in beverages, has been largely prescribed in therapeutics as a carminative and stomachic in the treatment of disorders of the gastro-intestinal tract.



Drying Ginger, Sierra Leone
(From the Imperial Institute)

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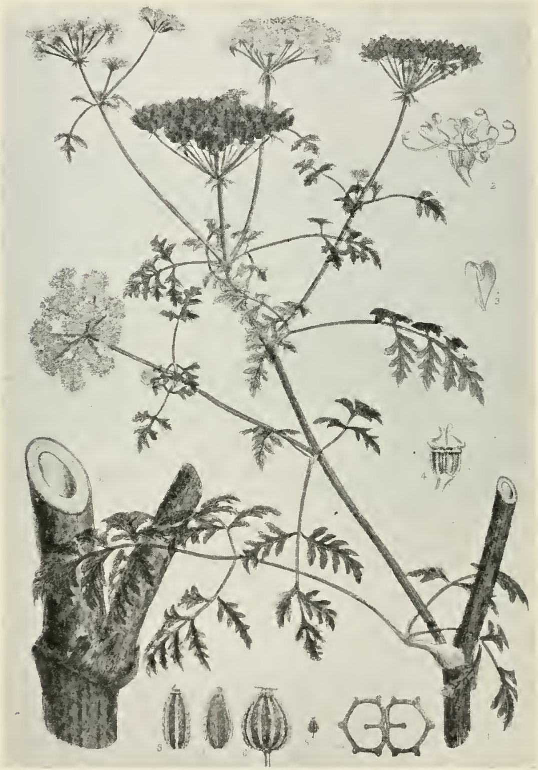
import direct large qantities of all varietes of Ginger, grind the rhizome in their own mills, extract the oleo-resin, distil the oil, and manufacture all official and unofficial preparations of the drug.

HEMLOCK ——— ENGLAND



Conium maculatum (Hemlock)

Drawn from a specimen grown in the Royal Botanic Society's Garden, Regent's Park.

1. Portion of the upper part of a large plant. 2. A flower. 3. A petal.
4. Pistil: 5, 6. Fruit. 7, Commissural, and 8, Dorsal surface of a mericarp.
9. Transverse section of fruit. 10. Part of lower portion of stem.

(2-4, 6-9, enlarged).

HEMLOCK, *Conium maculatum*, Linn., Fam. *Umbelliferæ*, is considered to be the famous State poison of ancient Greece and the one by which Socrates died. There are various grounds for this assumption, amongst them the fact that from Dioscorides's description it must have been a member of the *Umbelliferæ*, whilst his reference to its heavy odour and anise-like fruit might legitimately be made of hemlock as we know it to-day. Pliny is also stated to have described the plant, which was known to the Romans as *cicuta*. The latter name, however, has been assigned by modern botanists to a totally different genus. Hemlock played an important part in Anglo-Saxon medicine. The drug is mentioned in Keat's " Ode to a Nightingale."

The plant is indigenous to Europe, growing and being cultivated in England. Spotted or common Hemlock may be distinguished from other members of its family by the large, round, smooth-spotted stem and the smooth, dark, shining green colour of the lower leaves. Apart from differences in volucration and fruit, the bruised plant exhales a distinctly disagreeable smell.

Two plants, *Anthriscus sylvestris* Hoffm., wild chervil, and *Æthusa Cynapium* Linn., Fool's Parsley, might be confused with Hemlock, for details of these the reader should consult standard works of reference.

The plant was official in most pharmacopœias, including the B.P., until 1898; its use has, however, declined in recent years on account of the variation in therapeutic effect of its preparations. Present-day research, however, has accounted for this and recommended means for overcoming the drawback. Its chief constituents are coniine and conhydrine, both being contained in the stem, leaves and fruit. In full flower the stem contains about 0.06 per cent. and the leaves 0.18 per cent, whilst the mature seeds sometimes contain as much as 2.7 per cent. Collection of the herb is, therefore, carried out at the time the fruit forms.

The drug, which is employed in the form of a green extract and juice, exerts an antispasmodic action and is given in asthma, whooping cough and similar diseases.

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grow Hemlock on their farms at Long Melford but production is now small compared with the 30 and 40 ton crops handled there some score years or so ago.

HENBANE ——— ENGLAND

Gathering the flowering tops and leaves of Biennial
Henbane on StaffAllenS farms, Long Melford

HYOSCYAMUS has been in use from remote times, and its virtues were praised in particular by Dioscorides. It is mentioned in old Anglo-Saxon documents, and had a wide vogue medicinally as a sedative and anodyne throughout the Middle Ages.

Henbane is a member of the Solanaceæ or Nightshade family, a group of plants which includes tobacco and the potato. *Hyoscyamus niger* Linn., Fam. *Solanaceæ*, is cultivated in Suffolk and one or two of the Home Counties, and is found wild on waste spaces near ancient buildings. The unofficial Continental variety *Hyoscyamus albus* is a wild plant.

Biennial Henbane, as its name implies, is the second year's growth of the plant. In the first year it produces a mere rosette of large leaves lying close to the ground. In the second year it throws up a leafy flowering stem about 4 ft. or 5 ft. high, the leaves and flowering tops of which are now official.

The herb is grown from seed. The crop is difficult and capricious and gaps are frequent. About the end of June or beginning of July, the leaves and young branches are gathered from which, while they are still fresh, the Green Extract (B.P. '98) is prepared. The drug is now standardised by assay to contain 0.05% of the alkaloids of hyoscyamus. The Alkaloids of Henbane, Hyoscine and Hyoscyamine have replaced to some extent the drug itself in medicine ; the extracts and tincture, however, continue to have a wide use, the former being valuable in lessening the griping effect of purgatives. Henbane is given as an antispasmodic in various conditions such as whooping cough, asthma, etc. Hyoscine, also called scopolamine, has been administered in combination with morphine to produce " twilight sleep."

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grow a fine coloured leaf and flowering tops with a characteristic odour, and both the plant and the preparations freshly made from it at Long Melford are immeasurably superior to those of foreign origin.

HYDNOCARPUS (CHAULMOOGRA)—INDIA, F.M.S.

Hydnocarpus Anthelmintica, F.M.S.
(From the Royal Botanic Gardens, Kew)

CHAULMOOGRA OIL is obtained from *Taraktogenos Kurzii* (Fam. *Bixineæ*), a tall evergreen tree growing in the forests of Sylhet and Chittagong, and extending eastwards as far as Burma. Various species of the Hydnocarpus genus furnish oils which have been known as Chaulmoogra. *Hydnocarpus anthelmintica* and *H. wightiana* are important. The latter has become official in the B.P. 1932 and replaces chaulmoogra on account of the scarcity of supplies of this species. The same active principle would appear to be present in all these plants and also in *Oncoba Enchinata,* Oliv., a native of Sierra Leone. The seeds from which the oil is expressed are contained in fruit of the size of an orange, being embedded in large numbers in the pulp. A yield of about 30 per cent. oil is produced by pressing the seeds hydraulically.

Chaulmoogra would appear to have been used in medicine since early times. Its employment in leprosy is said to be recorded in a legend of the Hindu Vedas. It concerns a prince who was banished from his domain on account of leprosy. Whilst an outcast in the forest he fed himself upon a certain fruit, with the surprising result that he found himself healed and thereupon returned to claim his kingdom.

Buddhist relics of 1,000 years and more ago give evidence of the beneficial effect on lepers produced by the eating of the seeds of Chaulmoogra. In 1856 Mouart, of the Madras Medical Service, introduced the drug into Western medicine. In recent times it has found increased favour with famous leprologists—Sir Leonard Rogers and Dr. Muir in particular.

Chaulmoogra offers a striking instance of the introduction to modern medicine of a product which has been employed empirically since very remote periods. The old method was somewhat crude, the seeds were chewed in the mouth. In modern practice the soluble salts are administered hypodermically. The B.P. 1932 includes *Ol. Hydnocarpi* and *Ol. Hydnocarpi Aethylicum.* In 1900 Sir David Prain proved that Chaulmoogra Oil was obtained from *Taraktogenos Kurzii* and not from *Gynocardia odorata. Taraktogenos Kurzii* seeds are collected in Chittagong and sent to Calcutta. They are procured in dangerous forests and generally not before animals, such as bears, have finished eating the fruit.

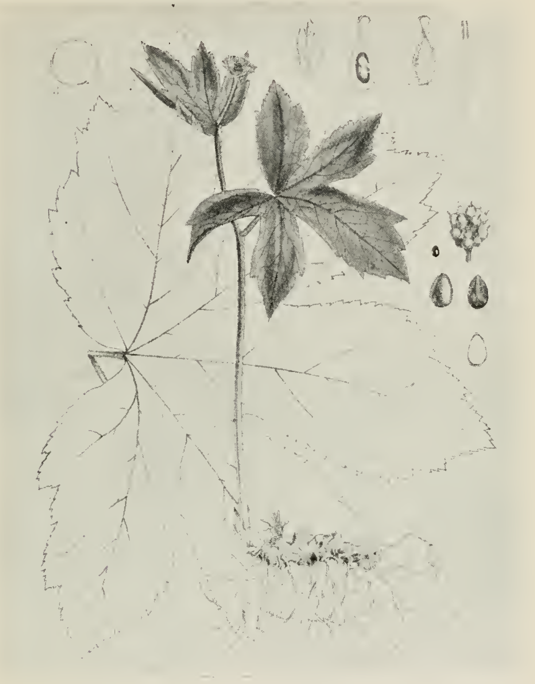
That the drug is worthy of mentioning in any work of materia medica may be seen from the view of Sir Leonard Rogers concerning the dreaded scourge of leprosy—" The great majority of early cases of leprosy can be cured for all practical purposes by the injection of Chaulmoogra and its derivatives. Chaulmoogra alone will enable a steady, if slow, reduction in the incidence of the disease to be effected wherever medical advice is available." The importance of this may be recognised when it is borne in mind that in 1928 it was estimated that there were 3,000,000 lepers in the world, including half-a-million in the British Empire. Drugs of the Hydnocarpus group are also given in many other tropical diseases.

We wish to acknowledge the very useful information obtained from the article by Dr. V. Iswariah, B.A., M.B., B.S., in the "Antiseptic," September, 1931.

StaffAllenS

offer all preparations of the Hydnocarpus group.

HYDRASTIS ——— CANADA



Hydrastis canadensis.

Drawn from a specimen in the British Museum collected in N. America by Clayton.

1. A plant in flower ; the sepals fallen. 2. A sepal. 3. A stamen. 4. A carpel. 5 The same opened. 6. Head of fruit. 7, 8. Seeds. 9. Section of the same. 10. A leaf full grown. 11. Diagram of the sepals.

From *Medicinal Plants*, Bentley & Trimen.

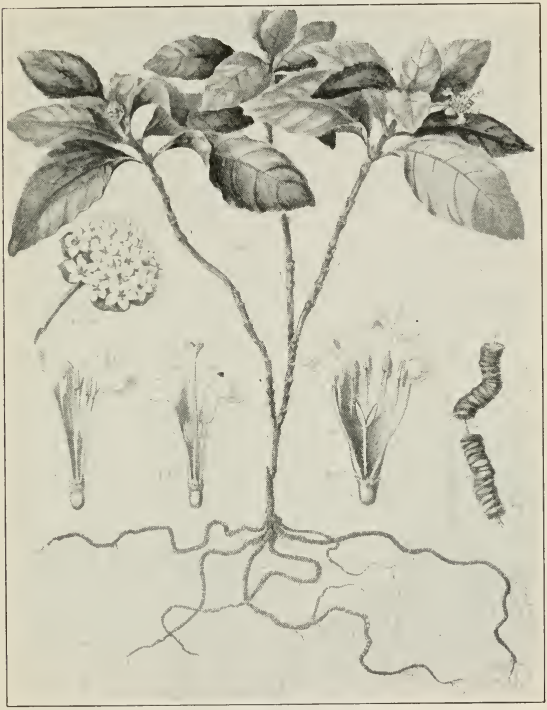
H*YDRASTIS canadensis*, Linn., Fam. *Ranunculaceæ*, commonly known as Golden Seal, is a small perennial herb native to Canada and the Eastern States of U.S.A. On account of its high commercial value it is cultivated in North America, and attempts have been made to grow it in Europe, but this is difficult. The plant requires a damp surface soil and matures very slowly, taking four or five years to produce the typical knotted branching rhizome. Furthermore, great care and attention has to be paid to the herb from the seedling stage until maturity, whilst there is a number of fungi and diseases to which Hydrastis is susceptible when not grown in its natural environment. The root has a characteristic colour, odour and formation, and is readily distinguishable from other herbs frequently collected with it.

The fruit matures about August. The head of small scarlet berries recalls the raspberry. The rootstock is indented with seal-like impressions, made by the shoots of previous years. These scars and its bright yellow colour have led to the plant being called " Golden Seal."

The herb was widely used from early times by the native Indians of N.A. for medicinal purposes and also for dyeing. There are two important active constituents, hydrastine and berberine. There is also another alkaloid, colourless, canadine, present. The yield of total alkaloid is usually about 5 per cent, about 1.5 °/o hydrastine and 3.5 °/o berberine. The former is colourless in the crystal state, the latter forms yellow needles. Both are bitter. The medicament is used as a general tonic stimulant and in local hæmorrhage of the nasal and other passages.

Owing to the great demand for the root in recent times, the cultivated plant has largely taken the place of the wild, supplies of which became inadequate. The plant is propagated by re-seeding. The roots are collected in the Autumn when the leaves have withered. In commerce, portions of stem are found attaching to the root since this remains for the fruit to ripen a considerable time after the plant has flowered.

IPECACUANHA
FEDERATED MALAY STATES



Cephaelis Ipecacuanha.

From the Royal Botanic Gardens, Kew.

1. Plant of Ipecacuanha (*Cephaelis Ipecacuanha*, Rich.) grown in the Royal Botanic Garden of Edinburgh. 2. Elliptical leaf. 3. An annulated root. 4. Capitulum. 5. Flower. 6. Flower. 7. Another flower.

IPECACUANHA has been used in medicine for centuries. It achieved fame first as a cure for dysentery in the 17th century, when the disease was rampant in the court of Louis XIV. Apparently it was given as a secret remedy by Helvetius (a famous Dutch physician of that time) to the Dauphin, who fell a victim to the disease. It was subsequently introduced to ethical medicine under its proper name.

Of the several varieties recognised *Psychotria* (*Cephaelis*) *Ipecacuanha*, Stokes, Fam. *Rubiaceæ*, true or Rio Ipecacuanha, is official in the B.P.

The shrub is indigenous to Brazil, where it is widely distributed, being found growing in clumps where there is plenty of shade and the ground is not too swampy. It is cultivated in Brazil, Federated Malay States, India and elsewhere.

Other varieties include Minas Ipecacuanha (Brazil), Indian (Johore) Ipecacuanha, cultivated chiefly in the Federated Malay States but also recently in India (both true Ipecacuanha) and Cartagena Ipecacuanha (Colombia), official in the U.S.P. but not in the B.P.

The root, which is fibrous and starchy, is the part used in medicine. The genuine varieties of Ipecacuanha, in addition to a large amount of starch, contain from 2 to 3 per cent. of the active alkaloids, emetine, cephaëline and psycotrine. The drug is given in small doses as an expectorant in cough and in large doses as an emetic. In dysentery the medicament is given orally and emetine hypodermically.

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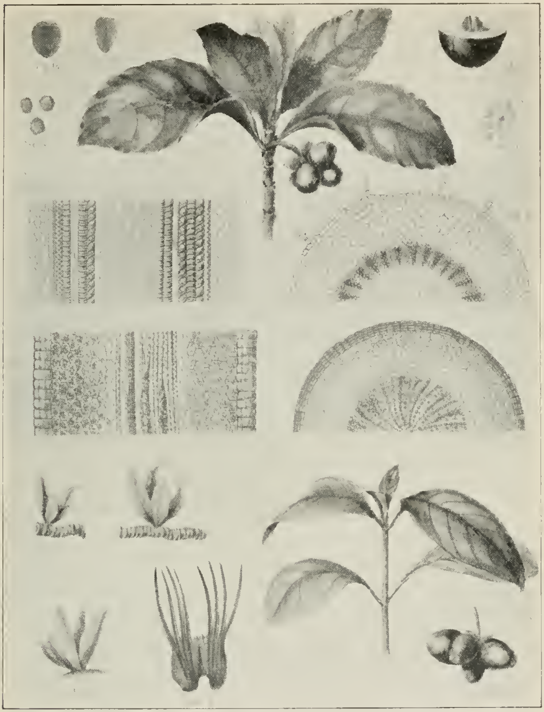
possess special overseas connections for the importation of Ipecacuanha root, and excellent facilities for the manufacture of preparations of the drug.



Cephaelis Ipecacuanha.

From the Royal Botanic Gardens, Kew.

1. Portion of Ipecacuanha plant (*Cephaelis Ipecacuanha*). 2. Transverse section of young herbaceous stem. 3. Longitudinal section of the same stem. 4. Transverse section of the root. 5. Longitudinal section of the root. 6. Two portions of the annulated root. 7. Young Rio Janeiro plant. 8. United stipules: 9. Glands. 10. Fruit of the Rio Janeiro plants. 11. One of the fruits. 12. One of the nucules removed. 13. Seed shown separately. 14. Pollen grains. 15. Sections of albumen of the seed.

LAVENDER ——— ENGLAND

Field of English Lavender, Long Melford.

OF THE three species of Lavender, *Lavandula vera*, D.C. *L. Spica* and *L. Stœchas* Linn., Fam. *Labiatæ*, the first-mentioned is that from which oil of Lavender is produced. The second yields *Ol. Lavandula Spicæ*, or oil of spike, whilst the third, although stated to be the source of true oil of spike, is not generally known to be distilled. It is the plant, however, which was known to the ancients, being referred to by Dioscorides, who states that its name Stœchas originated from the islands of Hyères near Toulon, where the flower still flourishes to-day.

Lavandula vera does not appear in the works of ancient writers, the first reference apparently being made by the Abbess Hildegarde, who lived near Bingen on the Rhine in the 12th century. It was known to the Physicians of Myddvai in the 13th century. The flowers have been used to fill cushions and sachets for generations. *Lavandula Stœchas* was commonly found in the shops at one time and appeared in the London Pharmacopœia of 1746. To-day, the essential oil obtained from the flowers gives wide scope to the perfumer, but careful blending and the use of fixatives are required to produce a first quality perfume.

English Lavender has always been justly praised for its fine aroma. It represents a product entirely distinctive from the French variety, and commands a much higher price. Some names, such as Mitcham in Surrey, have long been associated with the cultivation of Lavender, although the quantity actually produced there nowadays is comparatively small. A considerable acreage is laid under Lavender on Stafford Allens' Herb Farms at Long Melford, Suffolk, and here amidst ideal conditions, a particularly fine Lavender oil is distilled from the flowers. The sight of this delightful English flower in full bloom, the air redolent with the fragrance of a lavender coloured sea, undulating in the summer breeze, stretching away through the shimmering haze, and the silence unbroken save for the drone of the honey bee, is an experience never to be forgotten.

Lavender is not used to any great extent in medicine to-day. It was official as the oil and compound tincture in the B.P. 1914, however, being considered to possess aromatic and carminative properties useful in flatulence. The oil is frequently an ingredient of insectifuges against gnats, mosquitoes, etc.

The flowers are gathered, and distilled in the "Factory in the Fields" at Long Melford, and the oil, when mature, comes on the market as " StaffAllenS " English Oil of Lavender. As such, it has obtained pre-eminence both in England and America, possessing an aroma of surpassing excellence.

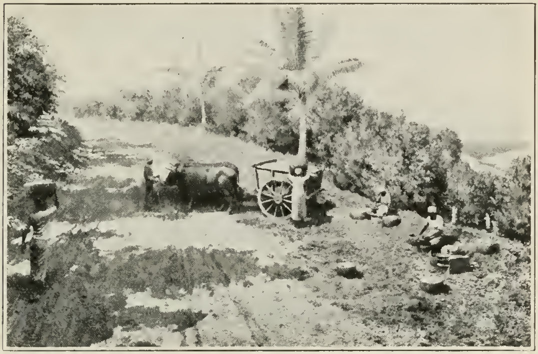
According to some French authors* Lavender oil acts as an anti-spasmodic, stimulant and tonic. A case is cited of gas gangrene, in which one application of Lavender oil proved entirely successful, thus bearing out the ancient Greek tradition that aromatic substances arrest putrefaction of the tissue. These French writers* also quote Montaigne, who expressed the opinion that perfumes should be more widely employed in the healing arts. In the case of Lavender, certain deleterious effects produced by the inhalation of some odours are considered to be absent.

* *See "The British Soap Manufacturer," April,* 1931.

StaffAllenS

have grown English Lavender for about a century and are specially placed to quote for an oil of surpassing excellence. Other varieties are also advantageously supplied.

LIME ——— BRITISH WEST INDIES



Lime Plantation, British West Indies
(From the Imperial Institute)

LIME trees produce fruit from which juice and oils are obtained. There are two chief kinds of oil, one is made from **Citrus aurantifolia* (Christm.) Swingle and the other from *C. Limetta Risso* (Fam. *Rutaceæ*). Both go under the name of limette oil, although they are often distinguished by the respective names of their sources—that is, West Indian and Italian limette oil. The oils are obtained in two ways. By expression (usually by an instrument known as the écuelle), which involves the rotation of the fruit in a copper pan with projecting spikes on the inside—as the oil is expressed it runs through a tube at the bottom into a receiver. They are also distilled.

West Indian oil of limes is distilled from the fruits of *C. aurantifolia*, a distinct plant of the West Indies, the juice of which contains a large amount of citric acid. Most of

**and/or C. Medica Linn. var. acida* Brandis the Oil comes from Jamaica and Dominica, although Citrus is grown on a larger scale in Montserrat, for the production of lime juice. The tree is also grown in Barbados, Trinidad, Antigua and St. Lucia. The cultivation of limes forms a basic industry in the British West Indies. The peel of the fruit yields by expression a golden-coloured oil, which is the true oil of limette. This differs markedly from the distilled oil obtained as a by-product in the evaporation of the juice, known commercially as oil of limes.

The chief crop is gathered between June and December. Comparatively flat or slightly undulating land is most suitable for the plants which, when young, have to be protected by a shelter of other trees. The production of lime juice is the main object of cultivation, but the expression of the oil is also undertaken on a large scale.

Heavy rollers are employed to crush the fruit and the juice is then concentrated ten times. The water evaporates carrying over the essential oil which, after removal from the aqueous distillate, becomes the distilled oil of commerce.

Citral is, perhaps, the important constituent of lime oil. It is present to a smaller extent in the distilled oil, the aroma and flavour of which are much inferior to those of the expressed oil. By distillation a barrel of fruit yields about 4 ozs. of oil. A blue fluorescent crystalline body (possibly methyl anthranilate) and limettin, ordinarily present in the expressed oil, are not found in the distilled oil. Limonene, bisabolene, linalol, linalyl esters and possibly phellandrene, have been found in lime oil.

Apart from Lime Juice, expressed and distilled oils of lime, the leaves, too, yield a highly aromatic oil. Comparatively large amounts of lime citrate are produced locally, whilst the concentrated lime juice furnishes considerable quantities of citric acid for English and European manufacturers.

Limes and lime juice have been used in the treatment of scurvy since the days when the New World and other remote parts were being discovered in sailing ships. It is curious that their value has only recently, as a result of the research upon vitamins, become scientifically understood. Oil of lime is widely employed in the flavouring of confectionery and beverages.

The boiling to which distilled oil is necessarily subjected brings about chemical changes in the terpenes and oxygenated constituents, which radically alter the flavour. The distilled oil has a flavour which has become sanctioned through the enormous consumption of Lime Juice as a beverage, whilst the hand-pressed oil has the citral-like flavour of fresh limes, approaching lemons, but with a vastly sweeter and more fragrant bouquet.

StaffAllenS

handle all Oils of Limes. The hand-pressed Oil is preferred by a number of consumers, being characterised by an extremely bland and agreeable flavour. StaffAllenS Terpeneless Lime Oil possesses certain acknowledged advantages. Its concentration is 1 to 15 and its solubility in 80% alcohol, 1 in 1. StaffAllenS distilled Oil of Limes is very useful for general purposes where a good but inexpensive product is required.

LOGWOOD

BRITISH HONDURAS, JAMAICA

Logwood Plantation, Jamaica
(From Imperial Institute Collection)

LOGWOOD, *Hœmatoxylon campechianum*, Linn., Fam. *Leguminosæ*, a tree growing to about 40 feet, is a native of Central America, but now naturalised in Jamaica and other West Indian Islands. The first reference to Logwood would appear to be in a letter from Honduras by Hernan Cortes to the Emperor Charles V in 1525. The plant was introduced to Jamaica by Dr. Barham in 1715. It would appear to have been known in England as far back as the 16th century. An act of Parliament, 1518, prohibited its use in dyeing. Throughout the 18th century, Great Britain and Spain were continually at strife with regard to the prerogative of cutting Logwood in the Bays of Campeachy and Honduras. At that time this territory formed practically the sole source of Logwood, which was an indispensable dye in the woollen industry. It might be said that the trade in Logwood played a significant part in English policy as regards its interests, not only in the British West Indies, but eventually in the whole of Latin America. The long, intermittent struggle between the English and the Spaniards at last came to an end in 1798, when against overwhelming odds the former defeated their opponents, and the British colony of Honduras was definitely established.

For a very long period Logwood was principally used as a dye in the woollen industry. It has, however, found a place in medicine for centuries, and is still used. It appeared in the London Pharmacopœia of 1746. The product comes on to the market in the form of chips of logs from which both bark and sap have been removed. In medicine, the unfermented chips are employed. Jamaica and British Honduras are important sources of supply. The active principle of unfermented logwood is *hæmatoxylin* (about 10 per cent). During fermenting, by exposure to air and moistening, this constituent oxidises, and the chips take on a dark green, lustrous hue. "Bastard" Logwood is an inferior variety of the species.

Logwood is employed as an astringent in diarrhœa, particularly in phthisis, but also in dysentery and other diseases.

StaffAllenS

are specially placed for the supply of Ext. Hæmatoxyli and its other preparations.

MYRRH —— SOMALILAND

Dhidin (Myrrh) Tree, *Balsamodendron Myrrha*, on the Guban (Somaliland), shewing bruise made by the Somali (near trunk base) to promote exudation of the gum
(From the Government of the Somaliland Protectorate)

MYRRH, an oleo-gum-resin, is obtained from a small tree indigenous to North-Eastern Africa and Southern Arabia, that of commerce being chiefly produced in Somaliland. The name Myrrh would appear to be derived from the Hebrew and Arabic " mur," meaning bitter. Formerly myrrh was known officially as *Balsamodendron Myrrha*, Nees, but this has been changed to *Commiphora Myrrha*, Holmes, Fam. *Burseraceæ*, this genus now being considered to include the former as well as others.

The product obtained from trees in the coastal area—"The Guban"—and known as Guban Myrrh, has an oily character and is rated inferior to the powdery variety occurring in the hinterland, termed " ogo," or good Aden sorts.

Myrrh Sorts in London Warehouse
(From "The Chemist and Druggist")

The above-mentioned Myrrh is not to be confused with the myrrh of the Scriptures—this is apparently another species of Commiphora—*C. Erythræa var. glabrescens*, Engl. The latter is called Habbak hadi by the Somali in contrast to " Malmal " and " Ogo," the names given to the perfumed varieties. Pliny interestingly enough describes the perfumed kind under the term " Odovarea." Arabs call the medicinal product " herabol " and the perfumery article " bissabol." According to Allen's Commercial Organic Analysis, Herabol Myrrh is the only one used in pharmacy. Bissabol Myrrh is understood to be largely used in China for making joss sticks. The use of Myrrh goes back to very early times. It was a common ingredient of the incense, perfumes and unguents which played an important part in Hebrew ritual.

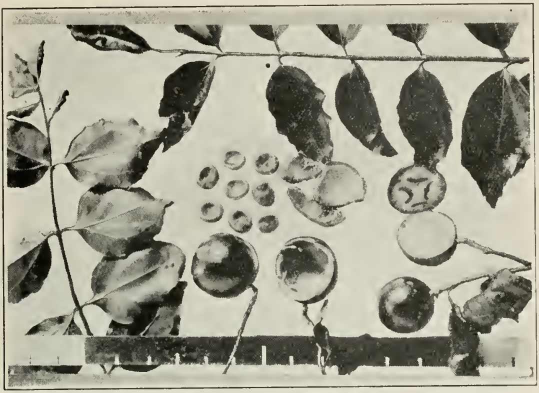
The lumps of Myrrh vary in size, from small granules to pieces as large as an egg. The product is very brittle and when pieces are fractured they display an unctuous character internally and a dark brown colour. Myrrh exudes both spontaneously from, and as a result of artificial bruising of, the bark. It possesses a distinctive, pleasant odour, and an aromatic, bitter taste. The product is exported from Somaliland and Aden, where it is put into bales and shipped to Bombay, there to be sorted into best quality for despatch to Europe, and lower grades for use in the Chinese trade.

Myrrh is official in the B.P. and U.S.P., being valued on account of its aromatic and carminative properties. It is frequently prescribed in mouth washes and gargles, and is a common ingredient of dentifrices. It also finds a useful place in perfumery.

StaffAllenS

employ from time to time practically every article in materia medica, including Myrrh, in the manufacture of pharmaceutical and perfumery products.

NUX-VOMICA ——— INDIA



Strychnos Nux-vomica
(From "The Chemist and Druggist")

STRYCHNOS NUX-VOMICA Linn., Fam. *Loganjaceæ*, is a fair-sized tree indigenous to practically the whole of India, but particularly the coastal areas. The fruit, of orange shape and size, contains a soft, bitter pulp, in which are the four or five very hard and intensely bitter seeds.

Nux-vomica may have been known to the ancients, but there is little evidence to prove this or that the drug, as tradition has it, was introduced to Europe by the Arabians, though the name has been stated to derive from a reference in a Latin translation of Serapion. The origin of the name is obscure, since there is no record of its ever having been used as an emetic. The fruits are also known as "Quakers' Buttons."

There are records that the drug was known in Germany in the 16th century, and it was to be had in England in the

Gathering Nux-vomica, India
Copyright, Alyson Minchin, Esq., I.F.S.

time of Parkinson (1640), who states that it was chiefly used for the destruction of vermin.

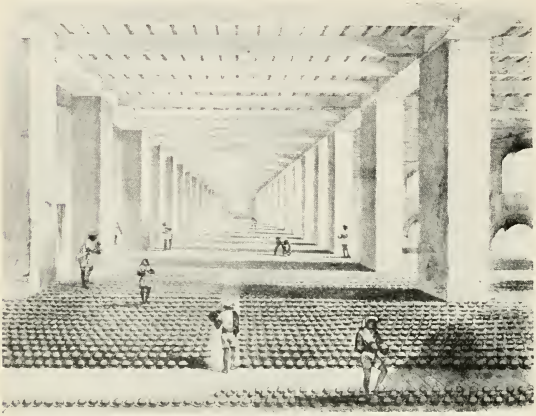
The largest amounts of the Nux-vomica of commerce come from the Madras Presidency. Travancore, the Costin Hills and the Malabar and Coromandel coasts are the chief collection districts. Collection of the fruits is a subsidiary occupation of tribal natives carried on largely by licence obtained at annual auctions arranged by the District Forest Officer. The seeds which contain the active principles are removed when ripe, cleaned, dried and sorted. They are mainly exported from Bombay.

Nux-vomica is official in nearly all Pharmacopœias. It is used in medicine as a stimulant and general tonic and owes its therapeutic value to the alkaloids strychnine and brucine, of which together it may contain between 2½ and 5 per cent. Strychnine was discovered in 1818 by Pelletier and Caventou in St. Ignatius' Beans, and almost immediately following in Nux-vomica. These two scientists (the former a pharmacist) were also the first to isolate quinine.

StaffAllenS

possess long experience in the manufacture of preparations of Nux-vomica, Standardised Powder, Extracts and Tinctures.

OPIUM ——— INDIA



Drying Opium, Patna
(From Kew Gardens Collection)

NO DRUG probably has a more interesting history than Opium. The Opium Poppy, *Papaver somniferum*, Fam. *Papaveraceæ*, is mentioned by Homer as growing in gardens. On account of its sleep-producing properties it was doubtless used for medicinal purposes from very early times. Reference to the milky juice which exudes from the capsule has been found in the works of Theophrastus, Dioscorides and others, whilst Wine of Opium was prescribed by Hippocrates, and from then on one finds the drug mentioned by all writers on medicine.

Cultivation of the Poppy extended successively over Asia Minor, Egypt, Persia, India and China. Its introduction to India would appear to be related to the spread of Islamism, being used probably as a substitute for wine, which was prohibited. In the days of the Moguls, Opium was the monopoly of the Government, and this subsequently passed into the hands of the East India Company. The " sleep-giving " poppy was known in England before Parkinson published his "Paradisus" in 1629.

Under favourable conditions the plant vegetates luxuriantly, growing to an average height of 4 feet. The seeds are changed from one division to another periodically, since this has been found to facilitate the best type of crop. The ground requires special preparation prior to sowing the seed, and effective irrigation subsequently. The petals of the full grown flower are carefully collected just before they begin to fall and made into circular cakes by pressing into a heated circular earthen or iron vessel. As a layer begins to exude the juice, so fresh petals are added until the cake is formed.

The darker, smaller " leaves," as they are termed in the Sudder factory, are used for the inside of the opium cakes of commerce, the large, whole petals being reserved for the outside.

Poppy latex is collected as follows. Late in the afternoon the natives repair to the fields and scarify the poppy capsules with a sharp iron instrument called a " nushtur," consisting of four narrow spikes. The scarificator, when one considers the structure and physiology of a poppy capsule, is admirably effective, and at an early hour on the following morning the juice which has exuded at the scarifications is collected by means of a trowel-like implement known as a "seetooah." The latex is scraped off and collected in an earthenware pot carried for the purpose by the gatherer. After the latex is collected the capsules are gathered from which an oil is extracted, to be used by the natives for lubricating or culinary purposes. The dry stems are also crushed and pulverised, to be employed in packing opium cakes.

The Opium latex obtained by the cultivator is now placed in a tilted vessel so that the "pussewah," a dark fluid sediment, may be drained off.

The Opium has to mature by exposure to the air, but not to the sun, until it attains a more or less standard consistency. The drug is examined by a native called the "Purkhea" and his verdict as to the quality of the product is almost invariably confirmed by subsequent laboratory tests. Freedom from "Pussewah," which is deleterious, is very important, and a fine is levied according to the amount present.

After tests for adulterants and impurities the opium has but little handling in the factory and after being weighed is put into store in wooden boxes. The product is eventually made into the well-known commercial spherical cakes, which contain a definite amount of opium encased with opium petals, gummed tightly together in layers by means of an adhesive known as "lewah."

Opium and its derivatives are probably the most valuable narcotics in materia medica. Altogether about 20 alkaloids have been isolated, of which morphine, codeine and narcotine are the most important. Space forbids any detailed reference to the chemistry and pharmacology of the drug, for which the student is referred to the existing mass of literature.

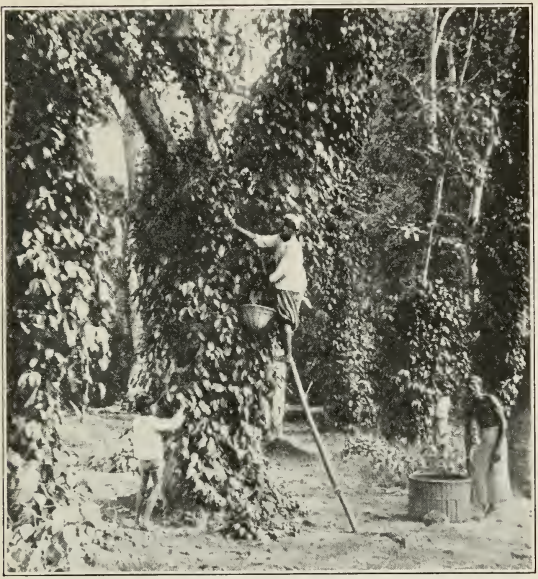
India once cultivated and exported Opium on a very large scale, the output going chiefly to China, where the variety was favoured. The Hague Conference (1912) and the more recent anti-narcotic regulations of the League of Nations, however, have drastically curtailed production. Nevertheless, considerable quantities came to this country during the war and Indian Opium is being increasingly employed by morphine manufacturers to-day. The principal cultivation areas are Behar and Benares. Manufacture is under Government Control, and formerly there were two important factories, one at Patna, and one at Ghazipur. The Patna factory was closed in 1907. Three varieties of Opium are made at Ghazipur: (1) Provision Opium for export; (2) Excise Opium for Home consumption; and (3) Medical Opium for shipment to London and for Indian Medical Department supplies. The first occurs in balls or cakes of about 3½ lb. The second is made up in packets, of which 60 make a chest. Medical Opium is made into cakes or square blocks of 2 lb., usually wrapped in oiled paper.

StaffAllenS

have prepared and standardised Opium for medicinal use in their Cowper Street factory for almost a century and manufacture all its preparations.

PEPPER

INDIA, CEYLON, STRAITS SETTLEMENTS



Pepper Garden, Ceylon.
(From the Imperial Institute Collection)

BLACK PEPPER is the dried unripe berries of *Piper nigrum*, Linn., Fam. *Piperaceæ*, a perennial woody vine, native of and cultivated in India, Ceylon and the East Indies. The fruits are sometimes dried in the sun and sometimes in kilns, in which case they become slightly smoked.

White Pepper is made from the ripe fruit of the same plant, by soaking in water or fermenting, and then rubbing off the outer portion of the pericarp, after which the fruit is dried.

Long Pepper, *Piperlongum* (*P. officinarum*) Linn., Fam. *Piperaceæ*, also cultivated in the foregoing territories, is an inferior and less pungent variety, rarely used in England nowadays.

The spice is one of the oldest. It was extensively used by the Greeks and Romans and was one of the chief trade commodities throughout the Middle Ages. Until the advent of modern merchandise such as sugar, coffee and cotton, it formed probably the largest cargo on the seas.

An instance of the value set on Pepper is that, during the siege of Rome, Alaric, King of the Goths, demanded, *inter alia*, in the ransom of the city, 3,000 pounds of Pepper. When Venice and Genoa flourished as City States, they owed almost their entire wealth to commerce in the spice.

The Malabar districts of India were producing Pepper as early as the 1st century, as recorded by a Greek geographer Strabo (B.C. 63-A.D. 21, during the reign of Augustus), when there was a fleet of 120 vessels plying between the Malabar Coast, Alexandria and Italy *via* a canal from the Red Sea to the Nile. Traces of this canal are said to exist to-day.

In the Middle Ages tribute was levied in Pepper, and " Pepper Rents " (the payment of a certain quantity of the spice at stated intervals) were common and shew the value placed upon it in those days. The term " Peppercorn rent," which has survived to our time, signifying a nominal rent, indicates the great deterioration in price which has occurred.

India provides three important varieties of Pepper, Aleppy, Tellichery and Mangalore, all cultivated in the Malabar Coast region. Tellichery is highly valued as a fine white pepper and is largely imported into America.

Concerning cultivation, according to Mukerji (*Handbook on Indian Agriculture*) the branches or shoots are layered, *i.e.*, bent down into the ground, and when they take root are severed from the parent vine and planted out in shade and trailed on to trees. This is done at the beginning of the rainy season. The base of every vine is kept scrupulously clean and well manured by cow dung cake, which acts as a mulch. Three or four years after planting, the vines begin to bear in cold weather. The small round berries of pepper grow on slender pendulous stalks, the number on a stem being usually from 20 to 30. The fruits, which are brown at first, turn red, and when ripe, yellow, being collected before maturity. After being dried they assume a dark brown or blackish colour.

In the Straits Settlements the plant is grown from ripe seeds or cuttings. Supports are necessary, wooden posts about 12 feet high being employed. It may produce some fruit the first year, but the main crop is harvested in the fourth year. In the Straits, too, Gambier is also grown with it. The leaves of the Gambier are used to cover the ground, serving as a protection to the pepper from excessive heat, and also acting as a manure. One plant on an average yields about 5 lbs. the third year, and 10 lbs. the fourth year. After this, the amount declines as the plant deteriorates.

Regarding other sources of Pepper, considerable changes have taken place in recent times, many former pepper plantations being taken over for rubber growing. However, the islands of the Eastern Archipelago have always produced large amounts of the spice, and the Straits Settlements, Borneo and Java continue to be the chief contributors to the world's supply.

Singapore Black Pepper, a product of the Malay Peninsula, is dried on mats over pots in which Gambier is being boiled—hence the smoke-like odour and dark colour of the product.

Johore and Trang Peppers are grown in Malaya. Penang Pepper, although shipped from that port, is cultivated in Sumatra and Java, from which the Lampong and Muntok varieties are also derived. Singapore and Penang are the chief ports of shipment for all East Indian pepper. Other Empire sources are Ceylon, East Africa and Sarawak. The first was one of the earliest, the third is one of the latest, sources of supply.

A resin, to which the sharp, pungent taste of Pepper is due, and an aromatic oil, are the two important constituents of the spice. There is also the alkaloid piperine, which possesses the property of delayed pungency, and from whose early chemical investigation arose the discovery of piperonal (now known as Heliotropin—the synthetic perfume) and piperidine (which in turn led to the series of so-called uric acid solvents headed by piperazine).

Pepper was formerly used, but is not now employed to any appreciable extent, in medicine. It is, however, sometimes a constituent of veterinary remedies. The essential oil of pepper (*Ol. Pip. Nig.*) is an important article of commerce, being used by perfumers and flavourists to give a distinctive, inimitable cachet to their compositions.

StaffAllenS

are specially placed for the supply of peppers which they have ground in their Cowper Street mills for decades.

PEPPERMINT ——— ENGLAND

Carting Peppermint. Long Melford.

PEPPERMINT, *Mentha piperita*, Huds., Fam. *Labiatæ*, is a member of the genus Mentha, which also embraces spearmint (*M. viridis*) and pennyroyal (*M. Pulegium*). These are most easily differentiated by their distinctive odours. They are all widely distributed over the temperate regions of the world. Peppermint would appear to have been first recognised in England by Dr. Eales—according to Ray in his " Synopsis Stirpium Britannicarum " (1696). In his third edition the latter states that it is superior to all other mints as a stomachic remedy and for diarrhœa. The plant found a place in the London Pharmacopœia of 1721.

There are one or two localities in England which are famous for the Peppermint and Lavender grown there. Mitcham, once the best known, does not produce anything like the quantity it formerly did, but cultivation there goes back to about 1750 and during the following century grew to considerable proportions. On account of the rise in land values and foreign competition, cultivation at Mitcham has latterly greatly decreased, but the plant is grown on a large scale at Long Melford, Suffolk. The dried plant is now little used, the herb being cultivated for the oil it yields on distillation.

There are three chief varieties of Peppermint Oil, English, American and Japanese.

The English Oil is considered to be without its peer as regards flavour ; distilled from *M. piperita var. officinalis* ("Black Peppermint"), it does not come on the market in very large quantities.

American Peppermint Oil, obtained from *M. piperita var. vulgaris and var. officinalis,* somewhat resembles English.

Japanese Oil is obtained from a different species, *M. arvensis Var. piperascens.* A by-product of menthol manufacture, it comes into commerce as a lower-priced product and is distinguished by containing in the crude state the highest amount of menthol—up to 80 per cent. Other commercial varieties are produced in France and Italy. *M. piperita* is considered by Gallic botanists to be a hybrid of *M. spicata* and *M. aquatica*, the English species being more closely related to the former and the French to the latter.

The main constituents of Peppermint oil are menthol and menthone. A further principle, pulegone, is occasionally found in all oils of the mentha group. English Peppermint also contains terpenes, sesquiterpenes and acetic and iso-valerianic acid in the form of esters.

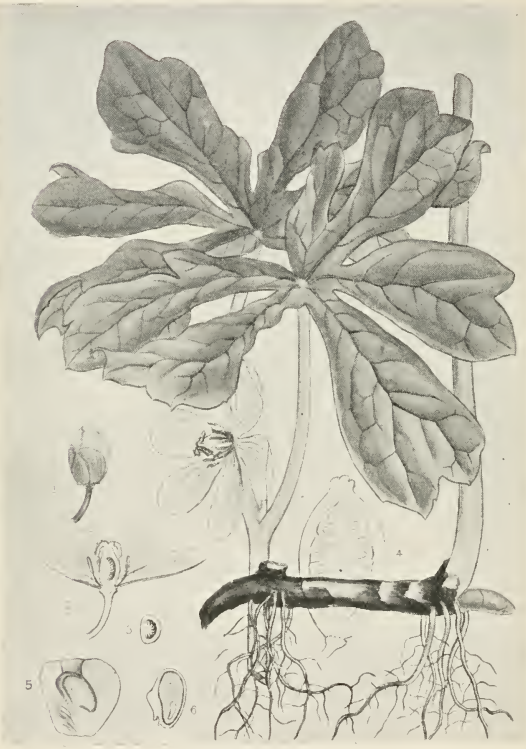
In England Peppermint plants are set in May. The second year crop produces the highest yield of oil but one crop is usually harvested each year about the end of August. The yield varies considerably, but 10 to 20 lbs. of oil per acre may be taken as an average. Distillation takes about six hours, most of the oil coming over in the first two hours.

Oil of Peppermint is official in the B.P. and U.S.P. and other pharmacopœias. Apart from its employment as a flavour, it is considered to possess stimulant aromatic properties of value in digestive disturbances. It has, of course, wide use in confectionery and perfumery, being a very popular flavouring agent in tooth pastes, chewing gums, etc.

StaffAllenS

have grown and distilled English Peppermint for nearly a century, and import and rectify all varieties of the Oil.

PODOPHYLLUM ——— CANADA



Podophyllum Peltatum

Drawn from a specimen cultivated in Kew Gardens; the fruit added from A. Gray. 1. A bud. 2. Vertical section of flower. 3. Transverse section of ovary. 4. Vertical section of fruit. 5. A seed showing the fleshy arillus. 6. Section of seed. (5 and 6 enlarged).

From *Medicinal Plants*, Bentley & Trimen.

TWO KINDS of Podophyllum are used in medicine to-day. *Podophyllum peltatum*, Linn. (Fam. *Berberideæ*) is a native of Eastern North America, from Hudson's Bay to Florida. About 2 feet high, it favours a humid, shady locality. The rhizome is known in England as American Mandrake, to distinguish it from English Mandrake, *Bryonia dioica*, Jacq., Fam. *Cucurbitaceæ*. The therapeutic properties of the plant were known in the 17th century and the drug was introduced into the U.S.P. in 1820 and the B.P. in 1864.

According to tradition, Podophyllum was employed as an emetic by the aborigines of the North American continent and is used in modern medicine as a purgative, particularly in the aged.

The active constituents of the drug are a neutral crystalline substance, podophyllotoxin, and an amorphous resin, podophylloresin. A further principle, picropodophyllin, is also present. The drug is given in small doses on account of its very vigorous purgative action.

The other podophyllum is obtained from *P. Emodi.*, Wall., Fam. *Berberideæ*, which is indigenous to Northern India, growing particularly in the neighbourhood of the Himalayas. This root markedly differs physically from the peltatum variety, being a knotty rhizome almost an inch thick, with a scarred upper surface. The two varieties are now official in the B.P., as the root and the resin. Podophyllin, as podophyllum resin B.P. is generally called in commerce, is obtained as a precipitate from acidified distilled water into which an alcoholic extractive of the root has been poured.

There is from 0.2 to 1 per cent podophyllotoxin in *P. peltatum* and 1 to 4 per cent. in *P. Emodi.* The resin is very much more active than the root itself. Probably on account of differences in soil, time of collection, etc., there is considerable variation in the chemical composition of commercial samples of podophyllum. This variation and other factors, such as the removal of an irritant known to cause griping, are the subject of research at the present day. Podophyllum is prescribed as an ingredient of vegetable laxatives and "liver" pills.

It may be mentioned that the name Mandrake has also been used in connection with *Mandragora officinarum* Linn. (Fam. *Solanaceæ*), a totally different herb which has a very long and interesting history, having been employed by famous practitioners since the time of Hippocrates. The determination of its active principles, hyoscyamine, hyoscine and mandragorine, was carried out in 1902, and its use on the Continent has within the last twenty years been definitely revived. The several varieties of the plant, which is a native of Southern Europe, have very much in common botanically and pharmaceutically with belladonna. Mandrake took its name from the forked shape of its root, which often resembles the figure of a man.

StaffAllenS

are favourably placed to quote for all Podophyllum preparations.

PYRETHRUM ——— ENGLAND, KENYA

Gathering Pyrethrum at Long Melford

TWO SPECIES of Pyrethrum figure in pharmacy, *Chrysanthemum cinerariæfolium* and *Anacylus Pyrethrum* D.C., both being members of the *Compositæ* family. Whilst most flower lovers are doubtless familiar with a close relative of the former—the common pyrethrum used so frequently as a floral border—few probably are aware that this variety contains the most powerful of known insect poisons.

The use of the flower for insect-destroying purposes is said to go back to the 16th century. The story goes that the attention of a Persian peasant was drawn to some dead insects beneath a bouquet of withered flowers. She noticed that they were pyrethrum flowers and to this accidental observation is presumably due the first use of pyrethrum for killing insects. The knowledge was confined for years to a few persons, who exploited the secret to their material advantage—hence the popular name of Persian Insect Powder.

Until recently the use of " Insect Flowers," as they are known in the drug trade, was mainly in manufacture of household insecticides in the form of dusting powders.

Within the last decade or so efforts have been made to utilise the insecticidal properties of Pyrethrum in a much wider field, namely, in the control of the insect pests which attack plants.

Many difficulties, however, stood in the way. In the first place the active principles, the pyrethrins, as they are called, lie in the interior of the plant cells, and consequently when applied as powdered flowers for horticultural spraying, do not readily come into contact with the insects.

In the second place, extracts of the flowers rapidly decompose, particularly when employed in the form of a soft-soap solution (a very common form), so that much research was needed to find a suitable solvent.

The active principles are of a highly complex nature, and for years their elucidation and isolation baffled chemists all over the world. In 1924, however, two Swiss chemists succeeded in isolating and determining the chemical composition of two highly toxic constituents which they named Pyrethrin I and Pyrethrin II. The first-mentioned is considered to be the most potent insecticide known. Cockroaches have been killed with solutions of 1 in 10,000.

Stafford Allen some time ago, as a result of original research, succeeded in manufacturing a purified extract which contains all the active principles of pyrethrum flowers in a highly concentrated and stable condition. A form of this specially suitable for horticultural purposes has been placed upon the market under the name of " Pysect." The firm also supply liquid extracts for mixing with kerosene to form highly efficient sprays against house-flies, mosquitoes, etc. In this form Pyrethrum has become extensively employed in all parts of the world.

Pyrethrum insecticides have one great advantage over nicotine, arsenic and the cyanides, in that they are non-poisonous to man or warm-blooded animals, and if properly used, harmless to vegetation. They are contact insecticides and kill both chewing and sucking insects.

That Nature should endow one of the humblest members of the vegetable kingdom with properties which provide perhaps the most important, safe and efficient protection against the insect pests which attack plants in general, is surely an extraordinary instance of her wonderful mystery and resourcefulness.

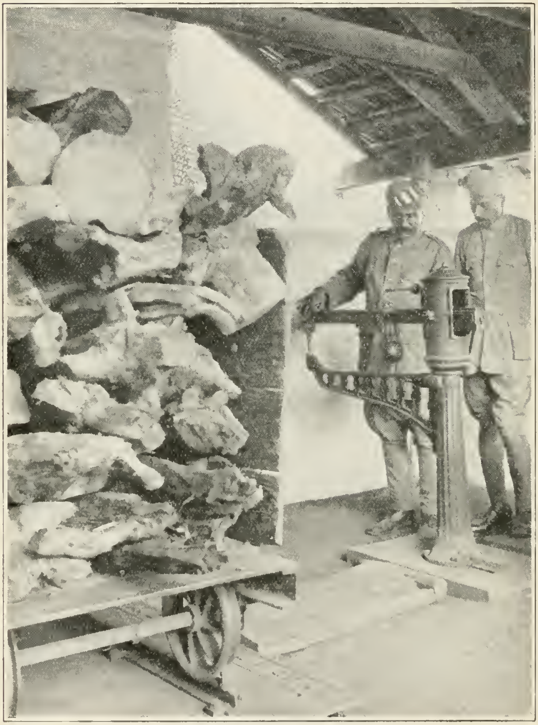
It might be mentioned in conclusion that preparations containing the active principles of Pyrethrum have been employed successfully as anthelmintics in both human and veterinary medicine.

The plant described above should not be confused with Pyrethrum (*Anacylus Pyrethrum* D.C.) or pellitory root, a drug official in the B.P. 1914 and a native of French tropical Africa, which is used as a masticatory and as an application to the gums in toothache.

StaffAllenS

have a considerable acreage of their Long Melford farms under Pyrethrum and are pioneers in the British Empire in the manufacture of all pyrethrum preparations, which are biologically standardised in their laboratories.

SANDALWOOD ——— INDIA



Weighing Sandalwood Billets in a forest sale depot (Koti).
Alyson Minchin, Esq., I.F.S. *(Copyright)*

SANDALWOOD, obtained from a tree (*Santalum album*, Linn., Fam. *Santalaceæ*) indigenous to Southern India and the Eastern Archipelago, has been used in India since time immemorial. Known in Sanskrit as Chandana, its first record is found in Nirukta, the oldest of the sacred books of the Vedic religion, written about the 5th century B.C. The wood is stated to have been introduced to Europe in the 11th century, quickly being recognised as one of the most precious aromatics of the East. It has always played an important part in Indian religious ritual, being employed in embalming, in funereal pyres and in the construction of temples—an example of the latter exists in the gates of Somnath, said to be 1,000 years old.

The tree is a root parasite—living on the surrounding vegetation by sending out suckers which attach themselves to other roots. In recent years great damage to the plant has been caused through Spike disease, and the problem of control has proved an extremely perplexing one. Some time ago a reward of 10,000 rupees was offered by the Maharajah of Mysore to anyone who could effect a cure. The offer was withdrawn after being open for three years, as no one succeeded in finding a remedy.

Although the tree grows abundantly in a rich soil, it produces the most perfumed wood when it grows in a dry, open area at the higher altitudes.

Sandalwood has formed an important industry in India, particularly in the State of Mysore and the Madras Presidency. The Government monopoly, which still exists in the former State, no longer obtains in Madras. Until the War the wood was almost entirely exported to Europe as such, but distillation of the oil, the valuable aromatic principle, is now being undertaken locally.

After uprooting the tree (which is a semi-parasite growing from 5 to 15 feet), the bark is stripped off and a portion of the sapwood removed. The trunks are then transported

Santal Tree, India

to " Kotis " (depots), where they are sorted for quality, sawn into pieces and stored ready for distillation or shipment.

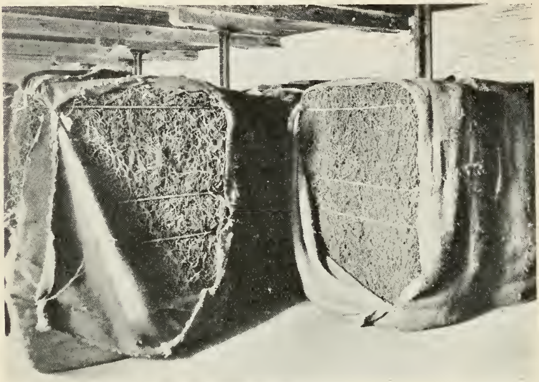
Possessing an exquisite fragrance, Sandalwood is invaluable in perfumery. It formerly found a definite place medicinally, but its use here has recently declined.

True East Indian Sandalwood must be carefully distinguished from other woods erroneously called by the same name, such as Australian Sandalwood (from *Fusanus spicatus* R. Br. Fam. *Santalaceæ*) and Venezuelan or West Indian Sandalwood (from *Amyris balsamifera* Linn., Fam. *Burseracæ*).

StaffAllenS

were the first to distil Sandalwood in England, probably in Europe, and after a century of experience in the production of Santal Oil, they are able to offer a product superior in aroma to that distilled in the East—it answers all pharmaceutical requirements and is the oil par excellence for perfumery.

SARSAPARILLA —— JAMAICA



Bales of Sarsaparilla in a Cutler Street Warehouse
(From "The Chemist and Druggist")

SARSAPARILLA is obtained from a group of plants of the genus Smilax, Fam. *Smilaceæ.* The drug was introduced to Europe from the West Indies about the year 1530, with a reputation of being valuable in *Lues Venerea*, and was soon being prescribed in most parts of the Continent and in England.

The name originates from the Spanish Zarzaparilla (Zarza = bramble and parilla = a vine) signifying a thorny vine. The plant is indigenous to Central and northern South America. There are numerous varieties, all woody climbers, which often ascend to considerable heights on lofty trees. The botany of Sarsaparilla long remained somewhat indefinite—the medicinal species inhabiting disease-infected swamps and consequently being difficult to investigate.

Explorers into South America in the last century described the obscure source of the plant—most of the supplies, it was found, emanated from the forests of the interior—being brought to the market centres by Indian natives.

Of the several marketed varieties of Sarsaparilla—Lima, Honduras, Vera Cruz and Jamaica—the latter is the most important both from the medicinal and commercial standpoints. It was not formerly obtained from Jamaica, apparently obtaining its name through the island acting as a clearing house for all kinds of the drug coming into trade. Nowadays, however, the drug is grown in Jamaica and considerable quantities are imported into England every year. It is shipped in bales, as shewn in our illustration. Commercially Jamaica Sarsaparilla is known as " Red Native."

Whilst study of Sarsaparilla in recent times has led to much greater knowledge of its botany, there has been a lack of official clinical confirmation of its therapeutic properties, resulting in the drug losing favour somewhat with medical practitioners. It appeared in the B.P. 1885 and 1898, but was dropped in the B.P. 1914. The continued use of the medicament, however, particularly in Europe and South America, with apparently useful results, would appear to warrant closer investigation of its therapeutics.

The chief constituent is a crystalline glucoside, sarsasaponin, there also being present sarsapic acid, resin, etc. It has not yet been shewn to what principle its medicinal effect is attributable.

The drug is given in rheumatism, certain skin diseases and syphilis.

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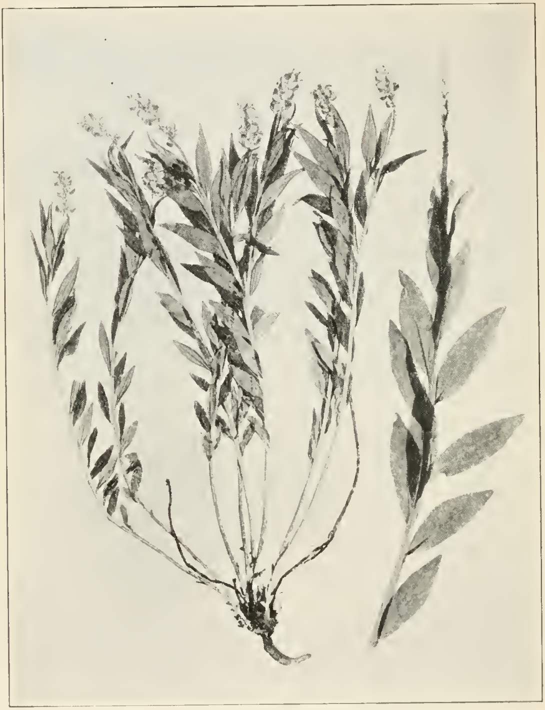
are favourably placed to quote
for Sarsaparilla and its preparations.

SENEGA —— CANADA



Polygala Senega
(From the Central Experimental Farm, Ottawa)

SENEGA ROOT is obtained from *Polygala Senega*, Linn., (Fam. *Polygaleæ*), indigenous to the prairie provinces of Canada. Senega would appear to have been used by the

Seneca tribe of North American Indians as an antidote to rattlesnake bite, being first introduced to this country in 1734. It has also been known by the names of Canadian Snakeroot, Milk-wort and Mountain Flax. It is said that a Scotch medico, one Dr. Tennet of Virginia, popularised its use after obtaining good results from it in pleuro-pneumonic affections.

A perennial, with slender stems growing to a foot in height, the plant displays spikes of white flowers, similar to those of the English milk-wort. It is found in rocky woodlands, the chief collection areas being British Columbia and Manitoba.

Senega root has a characteristic shape, being enlarged at the upper end into a knotty crown, bearing the remains of scaly leaves of a purplish hue.

Attempts to cultivate Senega have not proved successful, but the world's requirements are happily met from year to year by collection of the wild plant. It is gathered largely by Indians and travellers during the summer months. They commonly exchange their day's yield for the simple necessities of life at the nearest store. On the other hand it is also picked by farmers as a weed from arable land before sowing seed in the spring. By this casual but fairly well paid means, the crude drug reaches the local store and eventually Winnipeg, the market centre, where it is dried, cleaned and sorted for dispersement to all parts of the world.

The drug is occasionally adulterated, with roots similar in colour, such as American ginseng root, *Panax quinquefolium* or *Asclepias Vincetoxicum*, but the shape of Senega root is so characteristic that adulterations are easily recognised; there are, however, varieties of Senega in commerce derived from different species.

Ordinary Senega from *Polygala Senega*, Linn., is known in commerce as Western Senega. Northern Senega is obtained from a larger variety known as *P. Senega var. latifolia.* White, or Southern, Senega is the more slender root of *P. alba,* Nutt, and was formerly collected in the Southern States, but is now practically extinct there. The annual amount absorbed by the world is in the neighbourhood of 500,000 pounds. 90 per cent of this comes from the Western Provinces of Canada.

Although two glucosidal saponins, allied to the quillaia saponins, were described forty years ago, recent years have seen little further elucidation of the substances to which Senega owes its virtues as a stimulant expectorant. It is given in pneumonia, asthmatic affections and rheumatism.

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manufacture all Senega preparations.

SENNA —— INDIA, SUDAN

Wholesale Buyers Inspecting Samples of Senna.
London Commercial Sale Rooms, Mincing Lane.
This is an old photograph taken when top hats were de rigueur in the City.
(*From "The Chemist and Druggist"*)

SENNA would appear to have been used as far back as the 9th or 10th century. Isaac Judæus, an Egyptian who lived about A.D. 850-900, mentions it in his writings and states that the best variety came from Mecca. Both the leaves and pods of the plant were prescribed by Arabian physicians, and throughout the Middle Ages it seems to have had a considerable vogue in medicine. So popular did it become during that period that its cultivation was taken up in Italy, but as the resulting product was considered unsatisfactory, the enterprise lapsed.

Official Senna is obtained from two species : *Cassia acutifolia* Delile, and *C. angustifolia* Vahl., Fam. *Leguminosæ*. The first mentioned, a plant about 2 feet high with compound leaves, is a native of Arabia and the Sudan, and is known as Alexandrian Senna, since it was at one time exported from that port. Large amounts of Alexandrian Senna and Gum Arabic are collected in the Sudan, both products being transported by camel to the market centres, such as Omdurman and El Obeid, for sale by public auction and eventual shipment from Port Sudan.

The second species provides several commercial Sennas —namely, Arabian, Bombay or Mecca, and the more important Tinnevelly. It is indigenous to Arabia, Somaliland, Sindh and the Punjab provinces of India, where it is also cultivated extensively. Tinnevelly is principally exported from Bombay. Mecca Senna is an inferior variety obtained from wild plants in Arabia and elsewhere, sometimes found mixed with the better kinds.

Cleaning Senna, Sudan
(*From "The Chemist and Druggist"*)

Both pods and leaves of Alexandrian and Tinnevelly Sennas are imported in considerable quantities. The former nowadays are generally given preference on account of their milder nature, and their popularity has found official recognition in the B.P. 1932.

The raw drug is sold in Government Compounds, or Zarebas, situated in Omdurman. The Arabs are prohibited from selling their crude Senna by private treaty. It was found necessary some years ago in order to protect the Arab from the corrupt practices of certain native traders, to introduce the auction system, under Government supervision.

The Senna is cleaned and graded entirely by natives. In the first stage the large stalks and pods are eliminated, leaving the leaves, broken leaves and their impurities, to be dealt with subsequently. The process is carried out in special trays.

Our picture shows the final stage of the cleaning of the whole and broken leaves. This is done, as is seen, by sieves. Broken leaves, together with the remaining impurities, are shaken over the sieves, the small stems still remaining are picked out by hand and the Senna siftings and sand and finer impurities accumulate below the sieve and are dealt with in a separate section, for the grading of what is called Senna siftings.

The leaves are graded as follows:

(A) Whole leaves (used for packing in cartons).
(B) Whole leaves and half leaves mixed.
(C) Siftings.

(B) and (C) are used for manufacturing purposes.

The pods, which have been separated earlier, are now sorted by hand into several grades.

(A) Extra hand picked.
(B) Good hand picked.
(C) Ordinary hand picked.
(D) Manufacturing.

Grades (A), (B) and (C) are used in this country for packing into cartons, in which form they are sold direct to the public. The manufacturing grade is used for making liquid extracts, etc.

StaffAllenS

possess special facilities for obtaining supplies of the best Alexandrian and Tinnevelly Sennas (both pods and leaves) and manufacture all Senna preparations.

SPERMACETI and AMBERGRIS

NEW ZEALAND (Pacific Ocean)

Capturing a Sperm Whale *(Old time method)*
From the British Museum (Natural History) Collection

SPERMACETI, Cetaceum, is obtained mainly from the head cavity of the Sperm or Cachalot Whale, *Physeter macrocephalus*, Order *Cetacea*. It exists in crude sperm oil to the extent of about 11 per cent. A brittle, lustrous, white mass with a crystalline structure, practically tasteless and colourless, it consists principally of the palmitate of cetyl alcohol.

Spermaceti is used for the manufacture of sperm candles, but it enters into the composition of cerates, cold creams and pomades, and has been added to theobroma for making suppository mass. It was official and an ingredient in Ung. Cetacei B.P. 1914.

Ambergris is a peculiar substance also obtained from the sperm whale, being a pathological secretion. It is found in diseased animals and floating in the seas of warm climates off the coasts of New Zealand, Australia, South Africa and South Georgia. It owes its aromatic value to a principle known as ambrein, but requires to be kept for four or five years or more to develop its full odour. It is an extremely valuable fixative for perfumes generally.

Whaling forms an important industry in the above-mentioned ocean territories. Whereas formerly the animals were harpooned from sailing vessels, the modern method employs power driven ships and a steel apparatus which is shot into the whale like a torpedo, exploding mechanically inside the animal and being much more efficient than the old system.

Capturing a Whale, Ross Sea
(From the Govt. of New Zealand)

Sperm Oil is, of course, the material obtained from the whale in largest amount, but its price is much lower than that of spermaceti or ambergris. The latter is very valuable, depending upon the quality of the individual pieces, which fetch as much as £5 and £10 an ounce when sold wet from the sea, but much more when dried. In the past, the skipper of a small craft fortunate enough to pick up a considerable quantity of ambergris has been able to retire on the proceeds of the "catch."

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utilise Spermaceti and Ambergris in the manufacture of pharmaceutical and perfumery preparations.

VALERIAN —— ENGLAND

Field of Valerian, Long Melford

VALERIANA officinalis Linn., Fam. *Valerianeæ*, a perennial herb, is indigenous to practically the whole of Europe and is cultivated in England, America and Germany. The plant appears to have been known to the Greeks and Romans, although the word is not met with until the 9th or 10th century. Isaac Judæus mentions it in his *Opera Omnia*, 1515.

In old English it was known as Setwall and in former times the root was added to all varieties of food, apparently on medicinal grounds. In the 16th century its odour, now considered anything but pleasant, was accepted as a perfume and the root was placed among clothes, etc. The herb was commonly used by the Scandinavian peoples as far back as the 10th century.

The distilled water of Valerian gives an acid reaction to which attention was first drawn by Pentz in 1829. Grote two years later shewed that it was due to a characteristic acid, and not acetic acid. Dumas identified this with the acid obtained from amylic alcohol and with that extracted by Chevreul from the fat of Dolphins (Valerianic acid).

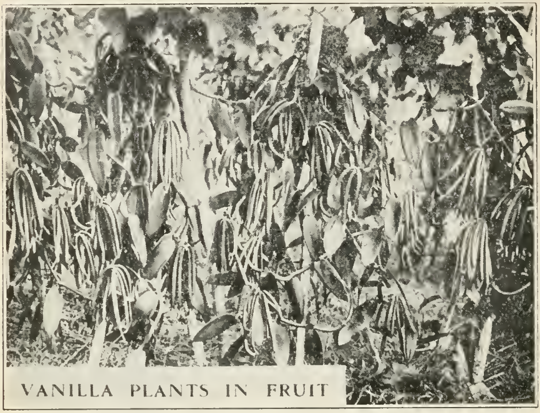
Valerian root contains a volatile oil, which varies in amount from $\frac{1}{2}$ to 2 per cent. The plant has stimulant and antispasmodic properties, which give it a place in internal medicine.

StaffAllenS

grow Valerian on their Long Melford Herb Farms and supply all preparations of the drug.

VANILLA

SEYCHELLES B.W.I. MAURITIUS



VANILLA PLANTS IN FRUIT

(From the Imperial Institute Collection)

TWO species of Vanilla, the climbing orchid indigenous to Central America, *Vanilla planifolia* Linn. and *V. pompona*, Fam. *Orchideæ*, are cultivated. The first, true Mexican Vanilla, is the one produced to the largest extent. Vanilla was used by the Aztecs before the European conquest of America, being adopted as a flavouring agent by the Spaniards.

The plant, which climbs to a considerable height, has long, succulent green stems and the pods, which are the part used, are elongated angular capsules, from 6 to 9 inches in length.

Vanilla became very popular during the 19th century, its cultivation being taken up in tropical countries all over the world. Several British Possessions contribute to the world's supply, the most important sources being British West Indies, British Honduras, Mauritius and the Seychelles.

Vanilla is widely used as a flavouring agent in all the culinary arts, and to some extent in medicine, where it has also been used as an aromatic stimulant and carminative. The chief aromatic constituent of Vanilla is Vanillin, which in the pure state is now largely produced synthetically from Eugenol and other sources. The natural product, however, as a flavouring agent, possesses markedly superior properties to those of the artificial preparation, which finds its principal use in perfumery.

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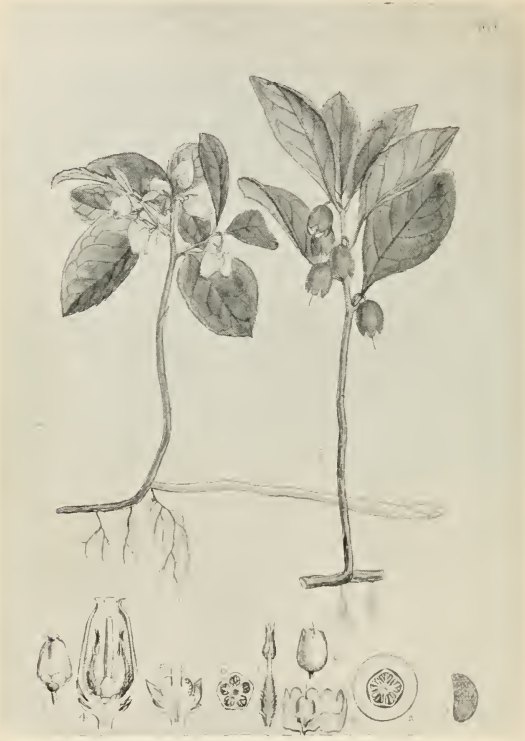
import Vanilla and supply preparations made from it, notably the fluid extract.

WINTERGREEN ——— CANADA



Gaultheria procumbens

1. A flowering branch from the Garden of the Apothecaries' Society. 2. A branch with fruit from the Royal Gardens, Kew. 3. A flower. 4. Vertical section of the same. 5. Vertical section of ovary. 6. Transverse section of ovary. 7. A stamen. 8. Fruit. 9. The same with the enlarged calyx partly removed. 10. Transverse section of same. 11. Seed. (4—7, 10 and 11 enlarged).

TRUE Oil of Wintergreen is obtained from the leaves of *Gaultheria procumbens*, Linn., Fam. *Ericaceæ*, a small creeping plant indigenous to Southern Canada and Northern U.S.A. The herb is known by a number of names, mountain tea, box berry, spice berry and ground holly. However, most of the natural oil of wintergreen of commerce is produced by distilling *Betula lenta* Linn. (sweet birch). This yields an oil practically indistinguishable from *Gaultheria*, and the yield being much greater the price is correspondingly lower.

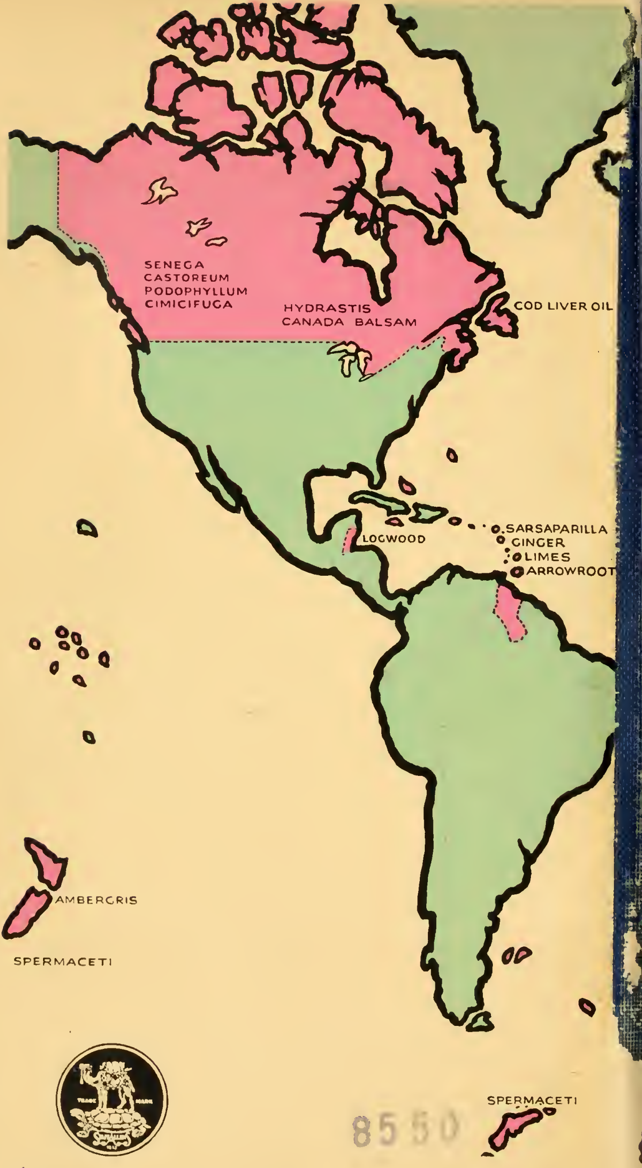
Both these natural products have been substituted in recent times very largely by synthetic oil of wintergreen, methyl salicylate, of which the natural oils contain 98 to 99.5 per cent. Nevertheless, on account of its slightly more delicate aroma, the natural oil continues to find a place in high grade pharmaceutical and toilet preparations such as dentifrices and chewing gums, etc., where wintergreen is most commonly employed as a flavouring agent.

The drug is also administered in capsule form in acute rheumatism, where it acts specifically. For external uses the synthetic preparation is generally preferred.

StaffAllenS

are in a position to quote for a superior
Oil of Wintergreen.

Printed in England for Stafford
Allen & Sons Ltd. by Walter
Pearce & Co., St. George's
Press, Brentford, Middlesex.



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